DEVELOPMENT OF A NONFORMAL EDUCATION PROGRAM EVALUATION PLAN: AN EVALUATION DESIGN FOR TWO YOUTH PROGRAMS IN DENALI NATIONAL PARK AND PRESERVE

A

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By Dana Lindauer

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Abstract

This project proposes an evaluation design for two youth programs that operate out of the Murie Science and Learning Center in Denali National Park and Preserve. The two programs, Denali Backcountry Expeditions and Denali Summer Science Academy, are offered to Alaskan high school and college aged students and are co-managed by the National Park Service and Alaska Geographic. A formative, utilization-focused evaluation for instructors and managers of the programs was created. The evaluation seeks to facilitate targeted program development through articulating program goals and assessing participant outcomes related to these goals. In an effort to establish collaborative goals, eleven stakeholders were interviewed. Through grounded coding of stakeholder interviews, current goals and objectives for both programs were identified. From the interviews, main themes regarding program outcomes included a desire to impact cognitive, affective, and attitudinal relations between public lands and participants, and to provide an opportunity for youth to experience personal growth and social/emotional development in an undeveloped, outdoor setting. These and five other domains of program goals resulting from the analysis of the stakeholder interviews informed the design of a suite of evaluation tools. Tools including youth participant and adult chaperone surveys, concept mapping, and instructor post-program reflections were developed to collect both qualitative and quantitative data about program outcomes in relation to goals. Hardcopy and digital evaluation tools were designed along with an accompanying user manual for instructors and managers of the two programs.

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List of Acronyms

DBE: Denali Backcountry Expeditions

DEI: Diversity, equity, and inclusion

DNPP: Denali National Park and Preserve

DSSA: Denali Summer Science Academy

MSLC: Murie Science and Learning Center

NAAEE: North American Association for Environmental Education

NPS: National Park Service

Introduction

Within the field of environmental education (EE), widespread opinions hold that rigorous, theory-driven evaluation is lacking (Bourke, 2011; Carleton-Hug & Hug, 2010; Flowers, 2010; Heimlich, 2010; Keene & Blumstein, 2010; Smith-Sebasto & Cavern, 2006). Simultaneously, there is an effort in the field to increase the use and research of evaluation in a time of increasing environmental concerns ("Beyond the Classroom", 2009; Keene & Blumstein, 2010). This follows the hope that effective EE programs will improve environmental literacy and action (National Environmental Education Advisory Council, 2005). This project involves developing one evaluation plan for two environmental education programs. Both programs are for Alaskan high school or college-aged students, occur in Denali National Park and Preserve, and are run in partnership with the National Park Service (NPS) and Alaska Geographic, a non-profit partner to public lands in Alaska. Both organizations work together to operate these programs out of the Murie Science and Learning Center (MSLC), a NPS Research Learning Center with a facility in Denali. This evaluation project adds to the endeavor to increase creativity with useful EE program evaluation while also considering the specifics of evaluating environmental education programs in Alaska for Alaskan youth.

The aim of this study is to develop a formative, utilization-focused evaluation (Patton, 1997) intended to provide data for the improvement of the two targeted environmental education programs so they better serve Alaskan youth. The evaluation's purpose encompasses three main targets. The first target is to clarify goals and objectives for both use in the evaluation as well as to improve communication between partnering organizations about program direction. The second target is to design evaluation tools that can function for both programs. This will aid in

streamlining evaluation systems for more effective use over multiple seasons of the programs. Third, the intent of the evaluation, past the scope of this project, is to get data from the evaluation tools into the hands of instructors and managers for program development and recruitment of future participants.

The intended users for the evaluation are the instructors and direct managers of the youth programs from the partnering organizations of the National Park Service (NPS) and Alaska Geographic. The evaluation is guided by three primary questions aimed to help these users with targeted program development.

1)What are the goals and desired outcomes for the programs?

2)How well are the programs meeting these goals and outcomes?

3)What are students taking away from the programs (either aligned with the goals or otherwise)?

Principally qualitative data will be collected through a suite of evaluation tools that will provide instructors and managers with answers to the guiding questions in an effort to tailor program development.

Summary of Programs for Evaluation Case Study

The two programs up for evaluation are Denali Backpacking Expeditions (DBE) and Denali Summer Science Academy (DSSA). These programs were selected since they share common participant ages, partnering management, and location. Additionally, both the NPS and Alaska Geographic in Denali are prioritizing an expansion of youth programs, and partnering managers agreed these two youth programs would most benefit from an evaluation plan.

For DBE, students travel to Denali with an Alaska Geographic instructor from the Anchorage office. Once in the park, they are joined by an NPS park ranger. In recent years, this program has included both high school participants, and a college group from the University of Alaska Anchorage (UAA). This program is structured around a multi-day backpacking trip in a wilderness area and can include volunteering in the park. DBE has been offered to student groups since summer 2015.

The Denali Backcountry Expeditions are part of an adventure education tradition of bringing teens into the wilderness for an outdoor skill-based excursion similar to Outward Bound styled philosophies (Gilbertson, Bates, McLaughlin, & Ewert, 2006). There is not a set curriculum, so much as a structured outdoor excursion to facilitate outdoor skill development, healthy group dynamics, and personal growth. While much of the program time is spent hiking and camping in undeveloped locations (without trails or backcountry campsites), there is also time for students to help the park with projects. In recent years, these groups have helped clear up construction debris in the park.

For DSSA, students arrive with a group chaperone in the park and meet up with an Alaska Geographic and NPS educator. Each group is recruited through an external organization, such as a tribal council or school district. The groups camp on their own at a fully developed front-country campground complete with running water. The instructors meet up with the group each day for four days, to facilitate participation in current research studies with park scientists. DSSA's inaugural summer was in 2016.

Starting in the summer of 2017 the key structure of the DSSA program solidified into mainly working with two park scientists, a biologist with a focus on mammals, and an

entomologist with interests in cataloguing insect populations. Each scientist has one day with the group and the students participate in the researchers' work, either through direct participation in a research study or executing a set of specific methods even if data isn't used. With the biologist, the students count snowshoe hare scat as part of a study that looks at hare abundance. With the entomologist, the students implement insect capture techniques, then identify the specimens the group collected. When these researchers are not available, other park scientists are contacted to help fill in. The park scientist interaction is a foundational building block of this program.

Below is a brief comparison of other basic facets of the two programs from summer 2019.

	Denali Backpacking Expeditions	**Denali Summer Science Academy**
Participants per session	6-10 high school or college aged students from Alaska	5-9 high school students from Alaska
Instructors	2 (One Alaska Geographic instructor from the Anchorage office, one NPS educator)	2 (One Alaska Geographic instructor from the Denali office, one NPS educator)
Duration	7 days	4 days (One 3 day program)
Main Program Components	• Setting up a backcountry campsite • Backcountry travel • Volunteering with NPS staff (rangers or scientists)	• Camping in a front-country, developed campground • Hiking • Working with park scientists on current research
Summer Sessions 2019	2	5

Stakeholders

Instructors and direct managers from Alaska Geographic and the NPS out of the Murie Science and Learning Center are the targeted stakeholders for this evaluation design because of its focus on program improvement that would be implemented by these parties. The two partnering organizations involved in program development and instruction include Alaska Geographic as the non-profit partner and the National Park Service through the specific park unit of Denali National Park and Preserve. Both partners operate under the strategic plan of the Murie Science and Learning Center, which houses both NPS and Alaska Geographic staff. Beyond direct instructors and managers, stakeholders from these organizations include general managers, such as Executive Directors, Managers of Interpretation and Education, and boards of directors. These organizations fund and operate the programs with the intent to expand connection to public lands in Alaska. These two managing organizations and the Murie Science and Learning Center operate under their own missions, each with a slight variation on the theme of conservation of public lands, with specific focus on national parks. The evaluation of these two programs reflects aspects of all three missions which can be found quoted below.

Organization	Mission Statement
Alaska Geographic	"Alaska Geographic works in partnership with public land agencies to connect people with Alaska's national parks, forests, refuges and lands through the creation and delivery of exceptional educational products and programs." (Alaska Geographic, 2018)
National Park Service (NPS)	"The National Park Service preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world." (National Park Service, 2019)
Murie Science and Learning	"The mission of the Murie Science and Learning Center is to promote science and stewardship on behalf of national parks in Alaska. Specific

Center (MSLC)	goals include: ● Engage the public with park science through interactive learning and research programs. ● Enhance the public's understanding of how parks use science to make management decisions. ● Share scientific findings in timely, compelling, and understandable ways. ● Use partnerships to enhance outreach offerings." (National Park Service, 2018)

Beyond Alaska Geographic and the NPS, other stakeholders include groups who bring youth participants to these programs. Alaska Geographic strives to build partnerships as part of its strategic plan, and has reached out to partner with a variety of organizations for both the DBE and DSSA programs (Alaska Geographic, 2018). In the past, Cook Inlet Tribal Council, Kenaitze Tribe, Fostering Science, Chugach Schools, Nenana Schools, and University of Alaska Anchorage have been some of the organizations to bring repeat youth groups. Each of these groups utilize environmental education programs offered out of Denali in different ways to meet the needs of their own students and programs. Alaskan youth participants and their broad communities are also stakeholders who benefit from improved program structure and program outcomes.

Personal Justification

My connection to Alaska Geographic in Denali strongly influences how and why I chose to create evaluation tools for these youth programs. Since my personal experience is a primary driver, I wish to divulge my connection to these programs fully before describing the project in further detail.

I have worked for Alaska Geographic at the Murie Science and Learning Center in Denali seasonally from the summer of 2015 to the summer of 2019. Starting in the winter of 2016, I was asked to create a program for high school students that would integrate outdoor experiences in Denali with hands-on exposure to current park science. This program has evolved into what is now DSSA. I wrote curriculum, developed materials, recruited students, coordinated with park scientists, and co-led the program with NPS partner instructors in its inaugural year. I have not directly led a DBE program, but have experience working with instructors who have.

Given that these programs are relatively new, and only two to five sessions are running a year, both programs are still in a phase of growth. Having worked through the initial four years of intermittent development for the DSSA program, I believe that with targeted development these programs will offer more to students and become more manageable for the organization to run. These programs are primed for formative evaluation.

My interest in program evaluation is twofold. First, I have worked in informal and nonformal education contexts for ten years facilitating program instruction and development, and wish to add a skill set of theory-derived evaluation planning. During student teaching in the 2017-2018 academic year, I implemented various forms of assessment for student work. I wish to establish a similar framework for assessing programs in nonformal education settings, including programs that involve outcomes such as attitude and behavior change. This project provides me with practical experience using programs I know to dive into the research and practice of program evaluation.

In addition to my professional development, my intention is to help with program development for these specific Denali programs. I hope that the evaluation tools created through

this project will provide targeted data that is easy to use by staff. I believe that through a formal evaluation process, both management and program instructors will be better equipped for adjusting these high school programs between summer seasons. From my experience, program development is currently driven by informal instructor feedback and some pre/post surveys crafted by various staff within both NPS and Alaska Geographic organizational structures. Different evaluation models exist for different programs, and evaluation tools such as surveys are often altered year to year, so data isn't comparable. Having a standardized evaluation tool to use for various high school programs run through the Murie Science and Learning Center will help streamline program assessment and development for instructors and managers.

Literature Review

Defining Nonformal Education

The DBE and DSSA programs both fall under the realm of nonformal education. For this project, I define nonformal education in contrast to formal education (Norland, 2005). Nonformal education programs have instructors and planned instructional elements, but do not occur in a formal classroom. Sometimes informal education is classified separately to encompass learning experiences that are led solely by participants, like in a self-guided museum visit (Dudzinska-Presmitzki & Grenier, 2008). For this study, I will consider these programs primarily through the lens of environmental education and place-based education, under the broad umbrella of nonformal education. Selecting these frameworks helps with establishing program goals and structure, as well as narrowing down the fields of literature to pull from when investigating evaluation practices.

Environmental Education Frameworks

Environmental education acts as the primary framework for this evaluation project due to the alignment between the purposes of EE and the missions of the organizations involved in the development of DBE and DSSA. A diversity of programs could be considered EE. Ardoin, Bowers, Roth, and Holthius (2018) confirm EE is tough to characterize, stating that it exists in an "interdisciplinary paradigm." Carleton-Hug and Hug (2010, p. 160) identify a multitude of disciplines that overlap with EE including "natural science, social studies, science, civics education... education, interpretation, conservation biology, visitor studies, environmental psychology, environmental sociology, community studies, environmental justice and public health." Heimlich (2010) provides another list of overlap, just within the realm of educational interventions dealing with the environment, writing, "Historically, environmental education has been affiliated with conservation education, outdoor education, nature study, education for sustainable development, environmental literacy, resource-based education programs, and other foci" (p. 180). If one considers instructional styles, programs can also be defined in a multitude of ways, including experiential learning, informal science education, project-based learning, hands-on learning, outdoor education, citizen science, etc. (Stern, Powell, & Hill, 2014). This diversity allows flexibility in identifying cognitive, attitudinal, and behavioral outcomes for programs, as well as inclusivity for a vast array of nonformal education programs under the broad concept of EE.

Given the diffuse nature of the discipline, this project adopts the National Environmental Education Advisory Council's (2005) succinct definition of environmental education as efforts to expand environmental literacy with the goal of having an informed populace when it comes to facing environmental issues. Additionally, the Tbilisi Declaration (UNESCO, 1978) and the

North American Association of Environmental Education's [NAAEE] (2019) *Guidelines for Excellence* in EE help define the field. The Tbilisi Declaration (UNESCO, 1978), from the world's first intergovernmental conference on EE, states that environmental education's aims are "to provide the necessary knowledge, understanding, values and skills needed by the general public and many occupational groups, for their participation in devising solutions to environmental questions" and "to enable people to understand the complexities of the environment and the need for nations to adapt their activities and pursue their development in ways which are harmonious with the environment" (p. 12). More recently, the NAAEE (2019) created guidelines intended to support K-12 students toward achieving environmental literacy through four strands of skills and knowledge: 1) questioning, analysis, and interpretation skills; 2) understanding environmental processes and systems (including human systems), 3) skills for understanding and addressing environmental issues, and 4) personal and civic responsibility. These large EE organizations all center efforts on environmental literacy including components of human action for the environment.

The mission of the Murie Science and Learning Center is essentially to share science, which addresses the NAAEE (2019) guideline of understanding environmental processes and systems. There is also a human action component of the mission which includes promoting stewardship (National Park Service, 2018). Alaska Geographic aims to change patterns of behavior between people and the environment, a tenet of the Tbilisi Declaration, through connecting people to public lands and encouraging volunteerism, and philanthropic support (Alaska Geographic, 2018). The National Park Service mission falls more under conservation than EE, but does include education in the mission statement (National Park Service, 2019).

In addition to alignment with organizational missions, many components of the Denali programs match environmental education constructs. Through the residential nature of the programs, students are encouraged to form connections to the environment and understand the management of Denali through a variety of experiences led by instructors, visiting Park staff, and peers. Students are invited to learn about the ecology of Denali through hands-on participation in field-science and recreation. Both programs also teach environmental behaviors including safety while recreating outdoors, how to interact with wildlife, and ways to leave minimal impact on the environment.

Place-Based Education Frameworks

In addition to examining these Denali programs through the lens of environmental education, specific learning models from place-based education also allow for interdisciplinary approaches through which to understand program success. The fact that these programs are located in Denali is of great importance. Both of these programs specifically target creating a connection between Alaskan youth and Alaskan Parks (D. Tomeo, personal communication, January 17, 2019). All program content draws from the resources of the land and National Park infrastructure. Place-based education utilizes local place to create meaningful, personalized learning experiences (Getting Smart, 2017). The broad aim of place-based learning is to reconnect students to their communities, to combat the trend of learning functioning as an isolated event within the confines of a school (Smith & Sobel, 2010). Hopefully this integration occurs as students learn science and public land management hands-on from the setting of a National Park.

While the programs being evaluated were not developed under a place-based framework, their objectives and basic structure meet the criteria for place-based education. Each program has multiple learning goals, like social-emotional learning, and service-learning, that often exist within a place-based framework (Getting Smart, 2017). One of the core tenets of these programs is to get youth to experience the park hands-on and become involved with social, political, scientific, and other modes of park recreation and management, with the hope of future commitment to public lands. This fits with Gruenewald's (2003) summation of place-conscious education: "It aims to enlist teachers and students in the firsthand experience of local life and in the political process of understanding and shaping what happens there" (p. 620). How adult leaders interface with youth participants also matches with place-based models. Place-based education recognizes how adults out of a formal school system with any expertise can still be educators for students (Smith & Sobel, 2010). For these high school programs, group leaders, park scientists, and other visiting experts do not play the role of a classroom teacher, but still teach their valuable personal connections and skills related to Denali. Additionally, place-based projects should benefit both the students and the community (Gruenewald, 2008), an idea that aligns well with Alaska Geographic and MSLC broad missions, and former stewardship projects that have been incorporated into these programs.

Place-based education often targets the local home of the students. For these programs, students mainly travel to Denali from Anchorage or Fairbanks rather than the local communities adjacent to the park, but an Alaskan identity and the goal of building relevance and a local constituency for Alaskan Parks tie into place-based frameworks. While place is often defined as something of a small scale, like one town, "place" is a contested term that can hold a host of

cultural and personal meaning (Cresswell, 2015). While Denali may not be the local community for these students, these programs hope to welcome participants into parks as part of their public or ancestral lands.

Place-based education is a more holistic approach than environmental education that fully integrates social, emotional, and cultural dimensions to the programs (Smith & Sobel, 2010). Many participants for these Denali programs are recruited from populations that are often underrepresented in EE programs, such as Alaska Native students, or students in the foster care system. Learning cross-cultural tensions, and exploring social and emotional potential of learning in National Parks factors into program implementation, even if it has not historically been explicit in program objectives. Considering DBE and DSSA as environmental education programs with place-based elements helps structure goal development as well as future program development by providing a framework of possible outcomes, instructional styles, and activities with the fields. Evaluation acts as an added tool to guide program improvement over time.

Evaluation for Environmental Education

Literature on EE evaluation reveals a host of challenges, including challenges to inserting evaluation culture into current institutional structures, challenges with evaluation instruments and data collection, and challenges with the diversity of objectives. Despite obstacles, evaluation is still a valuable pursuit for the field in order to continue offering quality programs. Amidst this climate of concern, there is still a desire to discover best practices.

Evaluation strengthens programs through all stages of development, from implementation evaluation at the start of a program, to summative evaluation after years of running a program. Many environmental education institutions have not embraced the practice (Carleton-Hug &

Hug, 2010; Crohn & Birnbaum, 2010; Norland, 2005). Friedman (2008) recognizes this could be a symptom of a small number of programs, possibly run by a small organization, not warranting the cost and time of a rigorous evaluation. Heimlich (2010) discusses how broader environmental organizations that have an environmental education component might not want to invest further into education programming that is not tied fully into broader organizational missions. One suggestion to mitigate this problem would be to ensure education programs and their evaluation are driven by an organization's mission (Heimlich, 2010). Carleton-Hug and Hug (2010) and Crohn and Birnbaum (2010) also point to a lack of staff experience and training with evaluation. Bourke (2011) also recognizes staffing challenges due to high turnover of seasonal positions and often a lack of support or knowledge for completing rigorous evaluations. Lack of institutional desire for evaluation, the staff to create and analyze evaluations, or funds for an external-evaluator, hinders environmental education evaluation. Luckily, for a formative evaluation, even a simple design that does not drain resources can assist with targeted program improvement (Monroe, 2010).

In addition to institutional scale challenges, lie challenges in data collection. First, instruments should be tailored to match with the informal learning environment, and ideally promote student learning in addition to collecting data (Kearney, 2009; National Research Council, 2009; NAAEE, 2009; Smith-Sebasto & Cavern, 2006). Though gathering quantitative data through pre/posttest models is quite common, these brief check-ins over a short span of time are not highly reliable when it comes to measuring change in adolescent attitudes and behaviors toward the environment or learning (Heimlich, 2010; Stern et al., 2014). Smith-Sebasto and Cavern (2006) also found issues with quantitative data when analyzing changes in attitudes after

an EE program, remarking that lack of completion was pervasive among participants. Another concern with trying to evaluate program outcomes is the possibility that short or long-term outcomes regarding environmental attitudes or behaviors could be a direct result of the program, but could also be a result of another experience (Ardoin et al., 2018; Friedman, 2018). Additional data collection concerns regard the often small sample size of a few participants in an EE program (Carleton-Hug & Hug, 2010), and not having a common instrument that is useable for a vast array of EE programs for the sake of comparing programs (Powell, Stern, Frensley & Moore, 2019). The vast array of trials and errors the literature reveals about EE evaluation provides a wealth of models for instrument design, and promotes creativity to try techniques that work for the individual user.

One of the main curiosities for an evaluation in EE is the diversity and scope of possible objectives. Evaluating EE programs through the lens of program objectives, requires sifting through a plethora of common outcomes for the field. The Tbilisi Declaration (UNESCO, 1978) originally declared five main categories for EE objectives regarding the environment and environmental problems: Awareness, Knowledge, Attitudes, Skills, and Participation. Informal Science Education (Friedman, 2008) outlines very similar areas for potential programmatic impact as EE, including "awareness, knowledge, or understanding; engagement or interest; attitude; behavior; skills." Stern et al. (2014) identified similar themes for environmental education program outcomes, while adding intention to change environmental behavior and enjoyment to the list. The field of EE has not reached consensus on even domains of objectives. Such a broad array of outcome categories have been reflected in historic objective statements for the programs in this study as well.

The diversity of objectives and objective categories for EE have expanded beyond the confines of environmental problems. Ardoin et al. (2018) when reviewing 119 articles evaluating EE program outcomes through empirical research identified 121 unique outcomes, which the authors categorized into their own classification system of six categories: knowledge, dispositions, competencies, behaviors, personal characteristics, and multi-domain outcomes (p. 8). The personal characteristic category from Ardoin et al. (2018) includes self-esteem and character development, which fall outside the purview of environmental awareness, knowledge, attitudes, skills, and participation. A taste of other outcomes cited in EE evaluations include trust (Ardoin, DiGiano, O'Connor & Podkul, 2017; Lekies, Yost & Rode, 2015), physical and mental well-being (Barton, Bragg, Pretty, Roberts & Wood, 2016; Briggs, Krasny, & Stedman, 2019), positive youth development (Briggs et al., 2019; Lekies et al., 2015; Stern, Powell, & Ardoin, 2011), community development (Ardoin, Biedenweg, & O'Connor, 2015; Briggs et al., 2019; Kearney, 2009), and self-efficacy (Braun, 2019). The definition of EE from the NAAEE (2016) allows for this broad array of non-environmentally focused outcomes, saying EE is a process that "informs and inspires," "influences attitude," and "motivates action."

A final caution with EE objectives is the propensity to aim for lofty, immeasurable outcomes. Monroe (2010) warns of the "unbridled optimism of environmental educators as they save the world" (p. 194). Rather than lessons targeting a specific cognitive ability, like adding fractions, nonformal environmental education programs often emphasize emotional or behavioral objectives ("Beyond the Classroom", 2009; Crohn & Birnbaum, 2010; Friedman, 2008; Heimlich, 2010). Changes in behavior and attitude can be tough to measure as they often evolve over a period of time longer than any single program, involve complex methods to measure these

complicated facets of human agency, and require self-reporting (Ardoin et al., 2015; Friedman, 2008; Heimlich, 2010; Lekies et al., 2015). EE educators are often caught in the assumption that a short-term outcome, like caring, or interest, is going to lead to bigger behavior changes like lifelong environmental stewardship (Carleton-Hug & Hug, 2010; Heimlich, 2010; Monroe, 2010), but testing for the former does not necessitate the latter. While increased pro-environmental behaviors and attitudes are certainly aims for the programs in this study, the challenges of measuring these domains limits the evaluation's focus on these areas.

Given the prevalence of these broad objectives in EE and this study's programs, program objectives must be distilled into something measurable for an evaluation. Some in the environmental education field encourage evaluators to utilize clearly articulated objectives (Flowers, 2010; Keene & Blumstein, 2010; NAAEE, 2009) Others believe writing a suite of programmatic goals and objectives for an evaluation has its flaws. Using a priori goals for evaluation can eliminate opportunities for collaborative goal setting between learners, and can obscure unanticipated and nuanced outcomes (Ardoin et al., 2015; National Research Council, 2009). There are other methods for evaluation besides measuring how programs are meeting goals, such as goal-free evaluation that focuses on any measurable effects, and development evaluation that focuses on the process of program improvement while realizing goals are changeable and often participant specific (Patton, 1997). While evaluation styles avoiding goals would benefit these programs as well, for this study, goals derived from stakeholder opinions were used to assist in measuring program outcomes. This was an efficient way to gather information about program outcomes at their current stage of a fairly established program

structure. Additionally, set goals might promote ease of communication between partnering organizations and levels of stakeholders involved.

Methods

The first phase of the evaluation focused on the first of the evaluation questions: What are the goals and desired outcomes of the programs? Stakeholder interviews were used to help answer this question, a common practice to increase acceptance and utility of evaluations (Geist, 2018; Patton, 1997; Zint, n.d.). From the interviews, content analysis elucidated unified program goals and objectives, as well as dominant themes. These goals and dominant themes informed the development of the evaluation tools. Stern, Powell, and Ardoin (2008; 2011) progressed through an evaluation process in a similar manner, starting with collaboration with stakeholders to determine goals, then collaborating to create survey items, followed by piloting and revising the instruments. A collaborative pilot and revision stage would be the next step on this project if it were to be extended past its current timeframe.

Program goals and objectives for both DBE and DSSA have been in flux over the last several years. I have observed instructors, including myself, writing new objectives over the last several summers these programs have run. To establish a consensus on programmatic goals, semi-structured interviews were completed with various stakeholders of both DBE and DSSA. Stakeholders were identified in four main categories: 1) General Managers, 2) Direct Managers, 3) Instructors, 4) Chaperones. General managers are individuals high up on organizational charts who are not directly involved with the specific programs of this case study, but have interest in how youth programming is implemented within the organization in general. Direct managers work at the Murie Science and Learning Center and manage staff and budgets for the programs.

They often interact with the students directly for brief check-ins at the start and end of programs. Instructors include NPS and Alaska Geographic employees who have led programs over the last two summers. Chaperones are only involved with DSSA and are adult leaders from outside organizations who bring youth groups to Denali and participate in all aspects of the program.

Twentyfour key stakeholders were identified: five general managers, two direct managers, seven instructors, and ten chaperones. Stakeholder lists were discussed with the Alaska Geographic Education Program Coordinator to check if there were any key stakeholders absent from the composed list. Emails were sent to ask for participation in this program assessment project. In total, eleven stakeholders responded and were interviewed either in person or by phone. Interviews ranged from seven to fifteen minutes in length. Each of the four main categories of stakeholders is represented in the sample: two general managers, two direct managers, three instructors, and four chaperones. The two direct managers were both interviewed twice, once for the DBE program and once for the DSSA program, yielding thirteen total interviews from eleven participants. Of those thirteen interviews, four focus on DBE, seven focus on DSSA, and two from general managers focus on youth programming in general.

Interview questions varied between stakeholder categories, as each stakeholder group has experience with different aspects of the program, from student experience to budgetary concerns (See Appendix G for Interview Questions). All questions were designed to address six main strategies of describing the program, including feedback on specific program components, desired impact on participants, observed outcomes, articulation of current objectives or goals, desired change in the program, and programmatic fit into organizational missions. The aim was for each interview to allow the stakeholder to describe his or her goal for the program from

various entrance points. Solely asking for the articulation of a clear, measurable objective often is more challenging than discussing desired outcomes (Patton, 1997). A range of similarly targeted questions about goals allowed for repetition of key themes for each individual as well as potential for outlier sub-objectives to come to light.

All interviews were transcribed and then coded through grounded coding. Each individual answer to each question, instead of the complete interview, was coded to reveal if certain individuals hit upon the same theme in multiple answers, as well as to compare the answers to specific questions across stakeholders.

Codes were analyzed using a couple of methods, mostly analyzing degree (how many participants were assigned a code) and frequency (how many total times a code was assigned). First, codes were inputted into UCINET for network analysis for all interviews to recognize any trends in dominant codes rated by degree and stakeholder groupings for all interviewed stakeholders. The main impression of this network for all interviewees was how everyone discussed programs in a unified construct. Smaller networks of just those involved in DBE and just those involved with DSSA were created to identify prominent codes rated by degree for each program. While the most prominent codes were different for each program, there was overlap once codes of slightly less degree were included, opening the possibility for one evaluation tool for both programs. These networks can be found in Appendix C.

In addition to network analysis, code analysis was done by hand to sort codes by each stakeholder type (Appendix B: Part II) and to compare overall frequency of codes (Appendix B: Part I). Codes for general managers, direct managers, instructors, and chaperones were sorted into codes with the highest frequency and degree to clarify dominant codes for each stakeholder

group. Additionally, dominant codes for the whole participant sample were identified through comparing codes of the highest frequency and highest degree among all interviewed. These dominant codes led to the identification of six dominant themes: 1) public lands, 2) soft-skills, 3) Denali content knowledge, 4) science, 5) outdoor skills, 6) participants.

For the six identified dominant themes, direct quotes linked to these codes were compiled in separate sheets to further analyze opinions on a given theme. In addition, quotes were pulled from all direct managers and instructors who specifically were asked to articulate goals and objectives for the programs.

From the quotes pulled from interviewees articulating goals and objectives, all mentioned goals and objectives were listed along with a note referencing who spoke in favor of that goal or objective. Most of the wording centered around general program goals rather than specific objectives centered around student outcomes.[1] These goals matched with the vast majority of each stakeholder group's priority codes. Where discrepancies or absence of main ideas were identified, goals and objectives were modified from other stakeholder main codes, recognizing that other codes from other questions also addressed big picture goals of the programs. Once themes from staff articulation of program goals and all stakeholder priority codes were identified, these themes were used to write program goals and objectives.

Seven general goal categories were identified. From those general goals, evolved goal statements influenced by the wording from instructors and direct managers. This initial round of goals were what Patton (1997) calls "activities goals," or goals that focus on what instructors can

[1] Patton (1997) describes that goals are "more general than objectives and encompass the purposes and aims of program subsystems" where objectives are "narrow and specific, stating what will be different as a result of program activities" (p.169).

do to bring about some, as yet undefined, student outcome. From the activity goals, objectives relating to student outcomes were created. These goals and objectives were sent to direct managers and instructors for feedback and revised. The final compilations of goals and objectives can be found in Appendix D.

Analysis of the six dominant themes and the identification of seven main goal categories guided the design of evaluation tools. Additionally, conversations with direct managers revealed a pattern of historically reading participant comments from evaluations more than using quantitative data. Quantitative data has presented challenges from difficulty in pairing pre and post survey responses with current technology and survey software in use, inconsistent student response, and small sample size (S. Mclane, personal communication, November 5, 2019). Thus, when designing the evaluation tools, qualitative data collection through open response questions and concept mapping activities was prioritized. Some questions that will yield quantifiable data were designed with the intent of retrieving basic information, like the percentage of students who had never been to Denali before and some demographic information. Questions for reporting race and ethnicity of students align with the United States Census Bureau (2018) and Anchorage School District (2019) reporting categories. General program feedback and comments on basic logistics of the program, such as food menus, were also included to maintain data collection that has been useful in previous evaluations for the partnering organizations. Questions about instructor performance were added to youth and chaperone surveys in response to several interviewed stakeholders mentioning the importance of instructors, as well as literature reviews on EE program evaluation recognizing a link between instructors and positive outcomes for participants (Stern et al., 2014). All evaluation tools in printable form can be found in Appendix

A. User manuals articulating how these tools are intended to be used can be found in Appendix F.

Findings

Forming Goals and Objectives

The seven identified goal categories for both DBE and DSSA are as follows: 1) Personal Growth and Social/Emotional Development, 2) Outdoor Skills, 3) Knowledge of Denali National Park and Preserve, 4) Knowledge of Public Lands, 5) Environmental and Public Lands Attitudes and Behaviors, 6) Knowledge of Cultural Content and Public Lands, 7) Expanding Participation. Though these goal categories originally were identified through the examination of how Murie Science and Learning Center staff articulated program goals and objectives, there is high alignment between the goal categories and codes for all participants. See the goal categories compared with related codes below.

Seven Goal Categories	Related Codes
1. Personal Growth and Social/Emotional Development	soft-skills confidence leadership team building
2. Outdoor Skills	outdoor skills future recreation
3. Knowledge of Denali National Park and Preserve	Denali content knowledge science location Denali
4. Knowledge of Public Lands	public lands
5. Environmental and Public Lands Attitudes and Behaviors	public lands inspiration

	enjoyment connection future park support park relevance stewardship
6. Knowledge of Cultural Content on Public Lands	DEI lack of Alaskans in parks lack of diversity in parks
7. Expanding Participation	partnership Alaskan youth DEI first time experience lack of Alaskans in parks lack of diversity in parks lack of youth in parks number of participants recruit more Alaskan audiences

Top Code Analysis

The most common code in terms of overall frequency was "public lands," which was assigned 24 times. The top code in regards to degree was "soft-skills," with nine separate participants assigned to that code. These two codes were addressed as dominant themes and all quotes coded under these terms were pulled for further analysis. Other dominant themes, defined by additional codes with high frequency and degree, that were examined further through quote compilations were "science," "outdoor skills," and "Denali content knowledge." Each of the individual codes pulled for further analysis represent broad conceptual themes, in comparison to specific program component codes, such as "hare pellet plot," which references a specific

field-science lesson. A sixth theme emerged related to several codes all linked to descriptions of participants, with the most prominent code for that group being "DEI."

Public Lands

Quotes coded as "public lands" focused on affective and cognitive aspects of student interactions with public lands. The affective quotes mainly focused on the objective to get people to appreciate and connect to public lands. All four managers interviewed shared similar language when reporting the importance of positive emotional connections to public lands.

Stakeholder	Quote
Direct Manager	"The main objective is to have more Alaskan youth connected with and appreciating the National Parks that they have right here in their backyard."
Direct Manager	"The main objectives are to inspire young people to care about the natural world, specifically within that to care about public lands as one way in which our country has decided to protect and preserve our natural lands."
General Manager	"The big one for us, is we want to keep people connected to public lands and understanding their value."
General Manager	"I think, long term, I would love to see increased partnerships with school districts, both in Alaskan cities as well as rural areas, to be able to connect students with [our] National Park and other park lands in Alaska."

The language shared in these quotes aligns with mission statements of Alaska Geographic, the National Park Service, and the Murie Science and Learning Center. These ideas of "connection to public lands" align with environmental education theories that if people are connected to nature they are more likely to engage in pro-environmental behavior (Cheng & Monroe, 2012; Louv, 2005; Nisbet & Zelenski, 2013; Perrin, 2018; Shultz, 2002).

Other emerging themes from public lands quotes involved more cognitive objectives. Some wanted participants to simply learn what public lands are. One instructor said, "[The students] are understanding what the….I guess the characteristics that define national parks are, and how Denali fits inside of that." Another hope was that participants would learn about how to recreate on public lands. A DSSA Chaperone said, "My goal was…[for students to] gain enough interest that they would want to come again and make sure that they knew how to explain to their families and friends how to get around the park, understand what frontcountry is, backcountry, what the transportation modules are, what are permitting requirements to go into the backcountry." Another cognitive aspect mentioned was understanding the role of science on public lands. One chaperone described his favorite part of the DSSA program as "the direct approach of having students, young people, be interacting with scientists, to see the scope of what role science has in National Parks." One last cognitive outcome was understanding public land management. An instructor said, "I have seen students who have never before been to a National Park understand...what park management looks like."

These affective and cognitive outcomes from interacting with public lands match the two main goal categories involving public lands: Environmental and Public Lands Attitude and Behaviors, and Knowledge of Public Lands. The Knowledge of Public Lands category addresses how well students reached the four cognitive concepts expressed by interviewees. Each of these cognitive concepts about public lands are addressed in the evaluation tools. To truly address behaviors and attitudes that often develop over years, not a one-week program, a longitudinal evaluation method would have more value than a pre/post survey immediately bookending the

program. Still, several survey questions and a concept mapping activity aim to address affective changes in regards to public lands.

Personal Growth and Social/Emotional Development

To analyze how the goals surrounding personal growth were spoken about, quotes assigned the code "soft-skills" were pulled. From these quotes, five main soft-skills were mentioned most frequently: leadership, confidence, teambuilding, facing a challenge, and introspective skills like empowerment and self-efficacy. Other mentions of soft-skills included public speaking and teaching, respect, responsibility, developing friendships, humility, curiosity, and maturity.

What stood out in the quotes about soft-skills was the value put on spending time on this kind of development. Having nine interviewees using this similar valuation provided evidence that one evaluation tool for both programs might be possible, if a main objective was soft-skill development, rather than specific content tailored to each individual program. Even though this program is an environmental education program, an outcome of environmental literacy did not emerge from the interviews as strongly as the theme of personal growth. The following quotes from a range of stakeholder groups emphasizes the value of personal growth and social/emotional learning through the DBE and DSSA programs.

Stakeholder	Quote
Instructor	"I think our program is starting to lead more into it being structured into a leadership development course, not only spending time outside and enjoying time outside."
Instructor	"I think there is this personal growth component that's really important."
Instructor	"Social-emotional development, soft skill development doing all of this, again, within the place of Denali, is a huge component."

Chaperone	"My main hope was that it [DSSA] would make them more confident. That it would make them more willing to try new things."
Direct Manager	"I think that it's very important that young people really benefit from having independent, successful new experiences with new peer groups and so I think that they probably come away with new friendships, new confidence in themselves as active learners, maybe more curiosity about the world."
General Manager	"It [DBE] builds the team of students together through camaraderie and cooperation and the students have such a sense of accomplishment when they come out."

The evaluation design incorporated open response and a few Likert scaled questions to determine youth, instructor, and chaperone perceptions about participants' personal development. In an evaluation of an IslandWood residential EE program, Kearney (2009) found evidence of personal development in youth participants through open-response student reflections that did not appear statistically significant from quantitative instruments in the evaluation.

Cognitive Outcome Codes

In addition to directly emphasizing the importance of personal growth and social/emotional development, many interviews explicitly downplayed the role of Denali specific content, whether that content were science or history. Any mention of teaching content, whether it was a positive or negative association, was coded as "Denali content knowledge." When examining all quotes coded as "Denali content knowledge," the overwhelming bias was that this content was less important than personal growth or simply being in the location of Denali. Six out of the eleven interviewed stakeholders discussed Denali content knowledge in this manner.

The following quotes helped inform the evaluation design by recognizing cognitive outcomes were not a top priority.

Stakeholder	Quote
Instructor	"I guess another goal would just be knowledge of the park, which...there's less emphasis of that, only because there's just not a lot of time in the day to sit down and talk about a full, you know, history lesson of Denali National Park, those things kind of fit in naturally as they organically come up in conversation when you're walking, but, so that's a very tertiary goal. If once all the needs are met, if we still have extra time, we can talk more about Denali National Park itself. It is really just used as a space for those other goals to be met."
Chaperone	"I think we also had science goals like to expose them to science, and it did that, but for me, the Denali Science component was not the most important part."
Direct Manager	"We do infuse, there's certainly a lot of science learning that happens on these expeditions. It's just that it can't take the front seat. It always has to be number three. Safety, and fun, always have to come first for these expeditions to be successful."
Chaperone	"Even though I'm a scientist, the science isn't that important in terms of… it's the mechanism to show kids that there is, there's stable, functional adults out there that want to be with them, you know? We call it science camp right? But it's really more than that."
Chaperone	"So the takeaway is more the experience, not a bit of knowledge."
Direct Manager	"We'll come up with all these great educational objectives, but the park and the weather become the main driving force to teach lessons to us. Let the park speak."

In addition to coding for mentions of Denali content knowledge, I also coded any mention of science as a specific discipline for content instruction as "science." Therefore, many of the quotes coded as "Denali content knowledge" I also coded as "science." Thus, the code science shows the same pattern of prioritizing other outcomes over science content knowledge.

In addition to this overarching pattern, many stakeholders did discuss that even if science was a secondary goal, they had some specific hopes in knowledge, skills, and abilities students would be exposed to. Some of the science components of programs highlighted, specifically from DSSA, include offering hands-on science lessons, learning about equipment and methods used by field researchers, understanding how science is used for management of public lands, and working directly with scientists. While a few specific activities were mentioned, like the snowshoe hare pellet surveys and completing an insect lab, there was not a trend that any one specific lesson was essential for students to experience. This could allow for flexibility in program planning. Evaluations do not need to focus on specific elements, but instead target a general exposure to field science and how science research benefits public lands.

Outdoor Skills

The code "outdoor skills" was common in regards to frequency and degree. When comparing quotes coded under this category, the statements were relatively similar in that they mentioned a hard skill relating to outdoor recreation. The preponderance of these mentions showed a valuation for sharing this skill set rather than explicit mentions of the importance of teaching outdoor skills. I created a list of specific outdoor skills that were mentioned during interviews, ranging from crossing a river to planning what to pack for a day hike. Then, I used this list to create a pre-survey list of activities for youth participants to rank how often they had participated in these activities. This piece of the evaluation tool aims to quantify how many students consider themselves new to these skill sets. This relates to another code with high frequency and degree, "first time experience," which highlights stakeholders perception that students benefit from having a new experience during the trip. I decided to evaluate if one of the

new experiences these programs offer is exposure to new outdoor skills. As "future recreation" was an impact code, having students exposed to new outdoor skills might prepare them for future recreation behaviors.

Participant Codes

The "first time experience" code was grouped together with "DEI," "lack of Alaskans in parks," "lack of diversity in parks," "lack of youth in parks," and "recruit more Alaskan audiences," to examine how stakeholders are framing discussions surrounding the identities of youth participants. There was an overarching trend of wanting to bring diverse audiences into National Parks and a recognition that National Parks are often exclusive. Comments explicitly or implicitly hinted at predominantly socio-economic, racial, and cultural barriers to recreation in National Parks, though many stakeholders kept language vague when mentioning diversity. All managers were heavily represented in the compiled quotes about participants.

Stakeholder	Quote
General Manager	"Being able to increase the number of students that are able to access the wilderness, especially those that may not have opportunities outside of this program."
General Manager	"What we're hearing across the board from our agency partners... is most of the people using public lands today are older and more affluent and the worry is that, you know, who are going to be the stewards of these lands in a generation?"
Direct Manager	"We have intentionally tried to connect with groups that'll bring more diverse audiences here to the park."
Instructor	"I think one other aspect of the program that needs to be addressed is the cultural deficit that I think, in its current form, a big part of the accommodation of the indigenous people on whose land the program occurs needs to be addressed in a more formal and specific way."

Direct Manager	"I'm very proud of what we've done to reach out to underserved populations, and bring in groups who otherwise wouldn't come here."
Direct Manager	"We do try to recruit youth that come from environments where they don't necessarily have the support to ever do something like this. Whether it be socio-economic or just their own family cultures is not one of backpacking. That we by making a concerted effort in recruiting them and making it at no cost to them that hopefully we're exposing kids who would never get this opportunity. So that's the other objective is to go for the non-traditional park user, and bring them here."
Direct Manager	"Why aren't young people from diverse backgrounds coming and enjoying our national parks?"
Direct Manager	"I think if anything, just like the park service, we recognize that most people visiting Alaska's public lands are not Alaskans."
Instructor	"Helping students who might not otherwise have the opportunity get into public lands or even know that they exist, to bring them to a public land area."
Chaperone	"It's hard because the Park Service is really white and environmental ed in general is really white."

The frequency and degree to which these comments appeared in the interviews led to the formation of two goals categories: Expanding Participation, and Knowledge of Cultural Content on Public Lands. These goals acknowledge the need and desire for inclusive public lands, though a larger paradigm shift in public land management, including acknowledgement of Indigenous rights and culturally inclusive definitions of the environment and wilderness, would be necessary to improve diversity, equity, and inclusion (Kantor, 2007; Nelson, 2003; Stern, Powell, & Ardoin, 2011; Stevens, 2014). Still, in designing assessment tools for evaluation, it is essential to consider the cultures of the participants (Briggs, Trautmann, & Phillips, 2019; Carleton-Hug & Hug, 2010; Friedman, 2008). Though cross-cultural evaluation is not the focus of this project,

perhaps these programs can help Alaskan youth find a platform for voicing how they see public lands making a paradigm shift and becoming more inclusive.

Evaluation Design: Concept Mapping

Given the dominance of broad conceptual themes in the interviews, like perceptions of public lands, diversity on public lands, and personal growth through outdoor experiences, I wanted to offer an evaluation tool that allowed students the freedom to express their opinions outside the confines of survey questions. I recommend the use of concept mapping as a way for students to visualize their personal perceptions and learning about public lands that can be integrated with programming in a timely manner. These concept maps can act as a pre/post framework for understanding outcomes while also helping students reflect on their own learning (Ardoin et al., 2015; Bourke, Buskist, & LoBello et al., 2013; National Research Council, 2009). Previous uses of concept mapping in residential environmental education have found success even when the central concepts of these maps are altered for each instructor and program (Bourke et al., 2013). Ideas for central concepts for DBE and DSSA include: backpacking, Denali National Park and Preserve, public lands, visiting public lands, outdoor recreation, What I can learn from Denali, Why Denali is (or isn't) important/relevant to me, Science in National Parks, etc. Concept maps can be analyzed quantitatively through counting the increase of unique terms in each student's pre and post map, or qualitatively through discussions or coding of which concepts emerge in post maps pervasively among the youth participants (Bourke et al., 2013; Kearney, 2009).

Statement of Bias

I come at this project from the perspective of an environmental education instructor with five years of experience with Alaska Geographic, and an additional four years of environmental education instruction with other organizations. Much of this experience has been with organizations that prioritize science learning and environmental literacy over outdoor skill development, social learning, or cross-cultural learning. My experiences as an instructor involved with program development in addition to my opinions about NPS and Alaska Geographic programs and missions influenced how I wrote goals and objectives. Stakeholder interviews moderated my own opinion about key objectives and potential outcomes as I utilized a systematic review of how the programs were discussed. A limitation on my analysis of the stakeholders was myself acting as the sole coder, which excludes any interrater-reliability.

An external evaluator would have less organizational bias when writing goals, developing evaluation tools, and collecting data (Stern, Powell & Ardoin, 2008). I, however, leveraged my familiarity with the managing organizations to develop a list of goals that I believe aligns with partnering organizations' missions, and a suite of tools that I think will be efficient and realistic for staff to implement with participants and to utilize for directed development. Having worked for five summers out of the Murie Science and Learning Center, I have a good sense of the demands on staff time and the need to strike a balance between simple implementation and yielding useful results. This allows me to focus the evaluation on the intended users and how they will use the evaluation, a main tenet of an utilization-focused evaluation (Patton, 1997).

I also have a bias between the two programs chosen for this case study. I do not have experience working with the Denali Backpacking Expeditions as they are guided by Alaska Geographic staff from the Anchorage office. For DSSA, I have been involved at multiple levels,

from development to instruction. This imbalance of knowledge between the two programs is both an advantage and disadvantage. When designing aspects of the evaluation, I often had the DSSA program in mind, with an understanding of what components I would like to have evaluated by participants and staff in order to improve program development. By questioning whether or not certain evaluation components would work for the backpacking expeditions, I was forced to consider tools that could be generalized for both programs. By focusing on the essential building blocks of each program, determined from the coded stakeholder interviews, I hope the evaluation tool will be more broadly applicable beyond the DSSA program.

Overall, this project reflects a predominantly western worldview of conservation, public lands, and stewardship. The organizations I work for promote scientific research that utilizes methodologies of mainstream academia and manage through federal definitions of land status. These perspectives are pervasive in the field of environmental education. I grew up in a family who enjoyed recreating in the outdoors and had the means to do so. I went to environmental education programs as a child, and had the privilege to construct a career in environmental education requiring several internships and moves across the country. Anecdotally, I know several of the stakeholders I interviewed could tell a similar sequence of events. These types of experiences generate a bias in promoting certain types of interactions between people and land.

Limitations

The largest limitation imposed on this project was my time frame. For both the efficacy of the evaluation tool and my professional development with program evaluation, seeing an evaluation through development, implementation, and analysis would be most beneficial. For this project, my focus was solely on developing a pilot evaluation tool. My prior experience with

these youth groups helped in crafting an informed tool, but I did not have the capacity to edit these tools after an initial round of implementation. The Likert scale questions in the youth participant pre and post surveys have no statistical reliability or validity since they were never tested. Analyzing a trial of youth participant answers and having some students comment on how they interpreted open response questions, would influence the wording and quantity of open response questions. Similar feedback would influence open response questions for instructors and chaperones.

The design of evaluation tools was also limited in scope by my goal to make them user focused. Alaska Geographic's program in Denali has two full time staff members in addition to five to seven seasonal staff that work roughly April-September. Knowing the constraints on staff time to make this small organization operate, my aim was to craft simple evaluation tools that could function for several years without needing extensive refinement. This lack of adaptability in the evaluation tool is not ideal, but will be most realistic to encourage continued use by program instructors and management. As I developed the evaluation materials and protocols for how to use said tools, I took into consideration specific items that I believed would be more effective if they were updated every few years as program dynamics change, such as articulation of program goals.

There are limitations in the design's ability to capture long-term impacts, and reliable impacts involving attitudes and behaviors on a short-term scale as well. Only one pre and post test over a short period of time does not capture a lasting change in youth attitudes to the environment and any cognitive changes noted may be more fact retrieval than fully synthesized knowledge (Heimlich, 2010). Ideally, attitude, knowledge and behavioral shifts could be

measured longitudinally as well, and corroborated by future academic or career choices (Williams & Chawla, 2016). Stern, Powell, and Ardoin (2008) measured the impacts of a residential EE program immediately after program completion as well as after three months, finding that not all outcomes persisted to the three month date. While sending out a few questions to youth a month to a year past program completion could provide valuable data, I do not believe many responses would be received. This would prove problematic given the already small sample of participants. A much higher return rate will result from all participants completing surveys and other activities during the course of the programs. Thus, the evaluation tools for youth participants focus on the data most likely to be collected, and are limited by self-reporting through pre and post surveys during the short time-frame of the program.

It could be possible to try to collect long-term data from contacting partnering organizations who have brought youth groups, particularly the adult chaperones with DSSA. These adults could be asked to report on any impacts they noticed in youth who attended the programs, and comment on if they organized any other environmental education programs in response to the DBE or DSSA program. White, Eberstein and Scott (2018) utilized such a model and sent out teacher surveys to gather data on long-term impacts a year after a bird feeding and monitoring program was implemented in primary schools.

The evaluation tools themselves are limited in that they involve several elements of self-reporting. Self-reporting on the experience of a program does not necessarily demonstrate actual changes in participants' attitudes, or behaviors due to the subjective and biased nature of self-reporting (National Research Council, 2009). One way to expand on self-reporting would be to develop embedded assessments for student learning that could be used toward evaluation of

the programs. Surveys continue to be a common evaluation tool for evaluating environmental education programs, but other methods, such as blogging, journaling, or observation tools, may show program outcomes as well (Ardoin et al., 2015; Ardoin, DiGiano, O'Connor, & Holthius, 2016; National Research Council, 2009). Such open-ended products could prove useful for understanding what students are taking away from the programs, but may be a challenge for multiple instructors and managers to implement and evaluate. Given time pressures during programs, instituting a lengthy activity may be a challenge for certain instructors, and time could also be a challenge for using rubrics or group meetings to discuss lengthy qualitative products. Incorporating concept mapping into the evaluation for these programs is a first attempt at using more open-ended student assessment tools to understand program outcomes. Like other open-ended assessments, concept mapping takes time for participants to complete and can be a challenge for instructors or managers to code (National Research Council, 2009). If using concept mapping proves to be effective and functional for instructors and managers to discuss outcomes, a shift away from surveys toward more of these types of assessments would be possible.

Impact and Plan for Dissemination

The ultimate impact for this project would best be achieved if the evaluation tool is used by Alaska Geographic and NPS staff. To best ensure use, I will present the evaluation tools to key management figures and instructors, and will continue to make my project available to any interested parties within the Murie Science and Learning Center network. Additionally, I hope my user manual for how to use these tools and the theoretical support for the evaluation design

will encourage use. Hopefully these elements of outreach will make the evaluation tools more user-friendly for future and current staff.

The evaluation tools from this project aim to assist primarily in program development. The identification of goals and objectives from a range of stakeholders will hopefully clarify program missions for instructors, assisting with communication between partnering organizations. With evaluation tools matched to program goals, both instructors and management from Alaska Geographic and the NPS will have qualitative data to utilize when revising these programs to create more impactful experiences for Alaskan youth. Better programs could have several positive impacts. Directly, youth participants will benefit from experiencing cohesive programs informed by past participants' experiences. Indirectly, these youth may bring back what they learn and experience into their communities. Also, stronger programs may result in more funding, higher levels of enrollment representing more Alaskan communities, and community support and involvement.

In general, this project also adds to informal education evaluation by looking specifically at programs for Alaskan youth. About half of the program participants in the past year identified as Alaska Native. The evaluation developed invites youth participants to reflect on cultural considerations for Alaskan youth in outdoor, environmental, place-based education programs. I hope the awareness of cultural tensions on public lands becomes a part of these programs. The evaluation of these and similar environmental education programs in Alaska should try to understand the strengths and weaknesses of the programs for diverse participants. In part, this could be achieved through the use of a variety of evaluation methods from surveys to group

discussions, and inviting instructors and evaluators from minority groups to participate in program development.

Narrative Reflection

First, a thank you to my committee for not only letting me, but encouraging me to explore a topic I was utterly new to and believing in my abilities to think through a challenge and learn through trial and error. Through this project, I have made a brief sojourn into the field of evaluation and am now more aware of how to navigate the domain to learn further. This project led me to the design of a suite of evaluation tools, but even better, provided me with a critical lens for recognizing how these and other evaluation tools could be improved upon. While the evaluation tools themselves may consist of only a few pages, every question and statement contained there-in is backed by literature or qualitative analysis of interview data.

My learning through this project has existed in multiple plains. First, I had the opportunity to explore research in environmental education, giving me a new academic perspective to my years of practical work in the field. I have read about the cultural constructs of nature and wilderness, explored Indigenous perspectives on public land management, and conceptualized the array of objectives in the field. Through literature reviews, interviewing stakeholders, and developing evaluation tools, I have expanded my skill set in this discipline, and have confidence this knowledge will serve me in any future work I may have in environmental education.

I also developed my skills in qualitative research methods. I utilized interviews, and various coding schemes towards this program assessment. Experience writing interview

questions, keeping interviews consistent and comfortable for participants, and spending time coding and recoding data let me explore my strengths in qualitative data collection and analysis. I spent the majority of my time with data analysis manipulating codes by hand rather than through software. I appreciate how this intimate knowledge of my codes helped me understand the metacognition of my grounded coding as well as the multitude of ways codes can be explored to reveal connections. I hope to continue developing these skills in the future.

This project has also introduced me to the field of evaluation, with its many applications. I take away an understanding of how collaboration should shape an evaluation's direction from every step of the process. Should I have an opportunity to complete an evaluation in any field moving forward, I will look to utilize stakeholders beyond the initial interviews I completed. Stakeholder input on guiding evaluation questions, writing goal and objective statements, and designing evaluation instruments would only create more buy-in to the evaluation plan and program direction.

This project was in part inspired by the range of assessment techniques I learned through the Elementary Post Baccalaureate Licensure Program. I consider much of what I learned from this project to be applicable from the small scale of a classroom and evaluations of student work, to the broad scale of universities and institutional education review.

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Appendix A: Evaluation Tools

- Youth Participant Pre-Program Survey
- Youth Participant Post-Program Survey
- Adult Chaperone Post-Program Survey
- Instructor Post-Program Reflection
- Manager and Instructor Post-Season Recap
- Concept Mapping Worksheets

Getting to Know You

Participant Pre-Program Questions

Your Name: _____ **Your Initials:** _____

What program are you participating in?

☐ Denali Summer Science Academy ☐ Denali Backcountry Expedition

What group are you a part of?

☐ CITC ☐ Fostering Science

☐ Kenaitze ☐ Nenana

☐ King Tech ☐ UAA/UAF

☐ Chugach Schools ☐ Other: _____

Which cultural or ethnic group(s) do you identify with? Check all that apply.

☐ Alaska Native or American Indian ☐ Native Hawaiin or Pacific Islander

☐ Asian ☐ White

☐ Black or African American ☐ Other: _____

☐ Hispanic or Latino/Latina

If you identify as Alaska Native, which cultural group(s) do you identify with? Check all that apply.

☐ Athabascan ☐ Inupiaq ☐ Tlingit

☐ Haida ☐ Tshimshian ☐ Eyak

☐ Yup'ik ☐ Cup'ik ☐ Unangan (Aleut)

☐ Sugpiaq ☐ Other

Mark how often you have done the following activities:

	Never	A Few Times	Many Times	I don't know.
Navigated and found routes while hiking	☐	☐	☐	☐
Hiked off of a maintained trail	☐	☐	☐	☐
Hiked on a trail	☐	☐	☐	☐
Hike up a mountain	☐	☐	☐	☐
Used camp stoves to cook meals	☐	☐	☐	☐
Set up a tent	☐	☐	☐	☐

	Never	A Few Times	Many Times	I don't know.
Picked a campsite	☐	☐	☐	☐
Backpacked overnight	☐	☐	☐	☐
Backpacked for over three days	☐	☐	☐	☐
Planned what to pack for a day or multiple days outdoors	☐	☐	☐	☐
Safely crossed a river on foot	☐	☐	☐	☐
Learned how to be safe around wildlife	☐	☐	☐	☐
Filtered water to drink	☐	☐	☐	☐
Practiced Leave No Trace principles	☐	☐	☐	☐
Visited Denali National Park and Preserve	☐	☐	☐	☐
Visited public lands	☐	☐	☐	☐
Collected scientific data outside	☐	☐	☐	☐
Helped clean up outdoor spaces	☐	☐	☐	☐
Used a topographic map	☐	☐	☐	☐

Rank how much you agree or disagree with these statements.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I consider myself to be a leader.	☐	☐	☐	☐	☐
I could guide my group on a hike.	☐	☐	☐	☐	☐
I think of my other group members as friends.	☐	☐	☐	☐	☐
I can rely on others in this group if I need help.	☐	☐	☐	☐	☐
I am excited about trying new things.	☐	☐	☐	☐	☐
I learn about myself when I spend time outside.	☐	☐	☐	☐	☐
I feel confident in my ability to stay safe outside.	☐	☐	☐	☐	☐
I can take care of my basic needs while being outside all day.	☐	☐	☐	☐	☐
I have the skills to hike on my own.	☐	☐	☐	☐	☐
I have the skills to backpack or camp on my own.	☐	☐	☐	☐	☐
I enjoy spending time outside.	☐	☐	☐	☐	☐
I feel inspired when I am in nature.	☐	☐	☐	☐	☐

I can identify plants and animals in Denali.	☐	☐	☐	☐	☐
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I can describe how at least one plant or animal is being studied in Denali.	☐	☐	☐	☐	☐
I am aware of different career paths to work in Denali.	☐	☐	☐	☐	☐
I would like to spend more time on public lands (National Parks, National Wildlife Refuges, National Forests, etc.)	☐	☐	☐	☐	☐
I know what public lands there are in Alaska.	☐	☐	☐	☐	☐

Tell us a little more about yourself--How would you describe yourself and your interests?

What do you like to do outside?

What are you excited to learn about or do on this trip?

What is one thing that you are nervous or worried about for the trip?

Are there any foods you absolutely will not (or cannot) eat?

Is there anything else we should know about you?

Post-Program Survey (Youth Participants)

Your Initials: _____

What program are you participating in?

☐ Denali Summer Science Academy ☐ Denali Backcountry Expedition

What group are you a part of?

☐ CITC ☐ Fostering Science

☐ Kenaitze ☐ Nenana

☐ King Tech ☐ UAA/UAF

☐ Chugach Schools ☐ Other: _____

Rank how much you agree or disagree with these statements.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I consider myself to be a leader.	☐	☐	☐	☐	☐
I could guide my group on a hike.	☐	☐	☐	☐	☐
I think of my other group members as friends.	☐	☐	☐	☐	☐
I can rely on others in this group if I need help.	☐	☐	☐	☐	☐
I am excited about trying new things.	☐	☐	☐	☐	☐
I learn about myself when I spend time outside.	☐	☐	☐	☐	☐
I feel confident in my ability to stay safe outside.	☐	☐	☐	☐	☐
I can take care of my basic needs while being outside all day.	☐	☐	☐	☐	☐
I have the skills to hike on my own.	☐	☐	☐	☐	☐
I have the skills to backpack or camp on my own.	☐	☐	☐	☐	☐
I enjoy spending time outside.	☐	☐	☐	☐	☐
I feel inspired when I am in nature.	☐	☐	☐	☐	☐
I can identify plants and animals in Denali.	☐	☐	☐	☐	☐
I can describe how at least one plant or animal is being studied in Denali.	☐	☐	☐	☐	☐
I am aware of different career paths to work in Denali.	☐	☐	☐	☐	☐
I would like to spend more time on public lands (National Parks, National Wildlife Refuges, National Forests, etc.)	☐	☐	☐	☐	☐

I know what public lands there are in Alaska.	☐	☐	☐	☐	☐

What was your favorite part of the trip?

What is one new thing you learned from this trip that you think will stick with you?

What is one outdoor skill you developed or worked on that you hope to use in the future?

Reflect on one way you feel like you grew, or challenged yourself, during this trip.

How would you like to use public lands in the future?

Who were your instructors?

Do you have any feedback on your instructors?

Chaperone Post-Program Evaluation

Thank you for bringing your students to Denali! Please answer the following questions to help us improve our programs for Alaskan youth.

What group are you a part of?

☐ CITC
☐ Fostering Science
☐ Kenaitze
☐ Nenana
☐ King Tech
☐ UAA/UAF
☐ Chugach Schools
☐ Other: _____

What is your favorite part of the program?

Which components of the program do you think were most successful at sharing park science and information about public lands with your students?

Please share an example of student growth you observed.

What was something that you noticed was a challenge for your students?

Would you like to partner with us again to bring youth into Denali? If yes, are there any changes you would like for your group if you come again next year?

Who were your instructors?

Do you have any feedback on your instructors?

Is there anything else you would like to share about the program?

Instructor Post-Program Reflection
(Program Snapshot and Program Goal Assessment)

- Please complete this form and the Program Goal Ranking Survey.
- Remember to take photos or scans of all pre and post concept maps and add them to the drive.
- Remember to upload photos.

Thanks for your hard work!

Your Name:

What program did you lead?

☐ Denali Summer Science Academy ☐ Denali Backcountry Expedition

What group did you lead?

☐ CITC ☐ Fostering Science

☐ Kenaitze ☐ Nenana

☐ King Tech ☐ UAA/UAF

☐ Chugach Schools ☐ Other: _____

Program Snapshot:

How many students were on your trip?

How long was your program (in days)?

Where in Denali did you take your group?

What instructional styles were implemented that you think helped student learning?

Please provide feedback on other adults who joined the group. Comment on content shared and instructional style. (Be positive, provisional, and specific. Think about information that would be useful for a future instructor working with these adults.)

Do you have any comments on food, gear, scheduling or other logistical challenges or successes?

Program Goals

How well do you think this program met the program goals?

Rank how well you think this particular program met its goals on a scale of 1-5. Write why you provided this ranking using specific examples when possible.

Goal 1: Offer experiences allowing for personal growth and leadership development.

	1	2	3	4	5	
This program did not meet this goal.	◯	◯	◯	◯	◯	This program excelled at meeting this goal

Explain your ranking for Goal 1 using specific examples.

Goal 2: Offer opportunities for youth to develop outdoor skills.

	1	2	3	4	5	
This program did not meet this goal.	◯	◯	◯	◯	◯	This program excelled at meeting this goal

Explain your ranking for Goal 2 using specific examples.

Goal 3: Provide opportunities to learn about content specific to Denali National Park and Preserve, including, when relevant, hands-on field science.

	1	2	3	4	5	
This program did not meet this goal.	◯	◯	◯	◯	◯	This program excelled at meeting this goal

Explain your ranking for Goal 3 using specific examples.

Goal 4: Build awareness about public lands through instruction about public lands, what they are, how they are managed, the role of science, and how to access them.

	1	2	3	4	5	
This program did not meet this goal.	○	○	○	○	○	This program excelled at meeting this goal

Explain your ranking for Goal 4 using specific examples.

Goal 5: Provide opportunities for positive connections to public lands in the hopes of fostering future pro-environmental behavior and future support of public lands.

	1	2	3	4	5	
This program did not meet this goal.	○	○	○	○	○	This program excelled at meeting this goal

Explain your ranking for Goal 5 using specific examples.

Goal 6: Acknowledge indigenous heritage of the lands programs are utilizing and discuss cultural tensions on public lands with students.

	1	2	3	4	5	
This program did not meet this goal.	○	○	○	○	○	This program excelled at meeting this goal

Explain your ranking for Goal 6 using specific examples.

Manager and Instructor Post-Season Recap

Meet as all DSSA and DBE instructors, or meet for each program independently depending on staff availability and desire to unite or differentiate between programs.

Recommended Instructor Preparation: Bring notes on the following questions

- What are your favorite parts of the program?
- What would you like to see changed?
- Comments on logistics, food, schedules, program length, number of participants, transportation, etc.
- Read all of the evaluations and review all the concept maps from campers (and chaperones if relevant) involved in your program. What are some trends that you notice in responses? Pick one comment you think exemplifies the program and its strengths. Pick one comment you think is surprising or shows an area for potential growth. Are there any trends in the concept maps or in student statements about what they noticed changed?

Recommended Discussion Questions for the Recap:

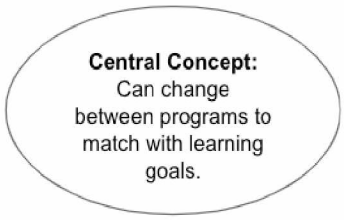
1. How are we meeting established goals?
    a. Use Appendix F: Part I to guide discussion of goals. Examine evidence from evaluation tools regarding Goals 1-6.
    b. Are there any goals we are not meeting?
        i. If yes, what do we need to change to meet this goal successfully?
    c. Are there any new goals that should be added?
2. What are favorite program components?
    a. Use Appendix F: Part I to guide discussions about youth and chaperone favorite program components, and instructor opinions about successful instructional styles.
    b. What are least favorite program components?
3. Are there any logistical problems that need to be addressed? If yes, what are the problems and what suggestions are there to improve logistics?
    a. Use Appendix F: Part I to guide review on program logistics utilizing instructor post-program reflections.
4. Does anyone have ideas for new partnerships?
    a. Use Appendix F: Part I to guide discussions about considering partnerships utilizing comments from chaperones' post-surveys.
5. What could be changed about the program to better meet student needs?
6. What are the top priorities for program development?

Record notes from the Post-Season Recap and maintain on computer drives for future review.

Name: _____

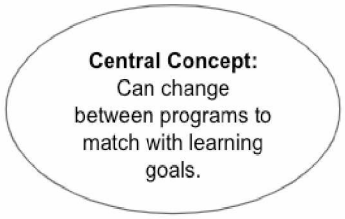
Concept Mapping Worksheet: First Day

Brainstorm a list of words that come to mind when you think of [insert central concept here]. Once you have a list you are happy with, think about how you could group some of your words together. Are there concepts or categories that describe how you grouped your words?
Use your categories and word list to create a concept map around the central concept. Be creative and show what you already know!



Name: _____

Concept Mapping Worksheet: Last Day

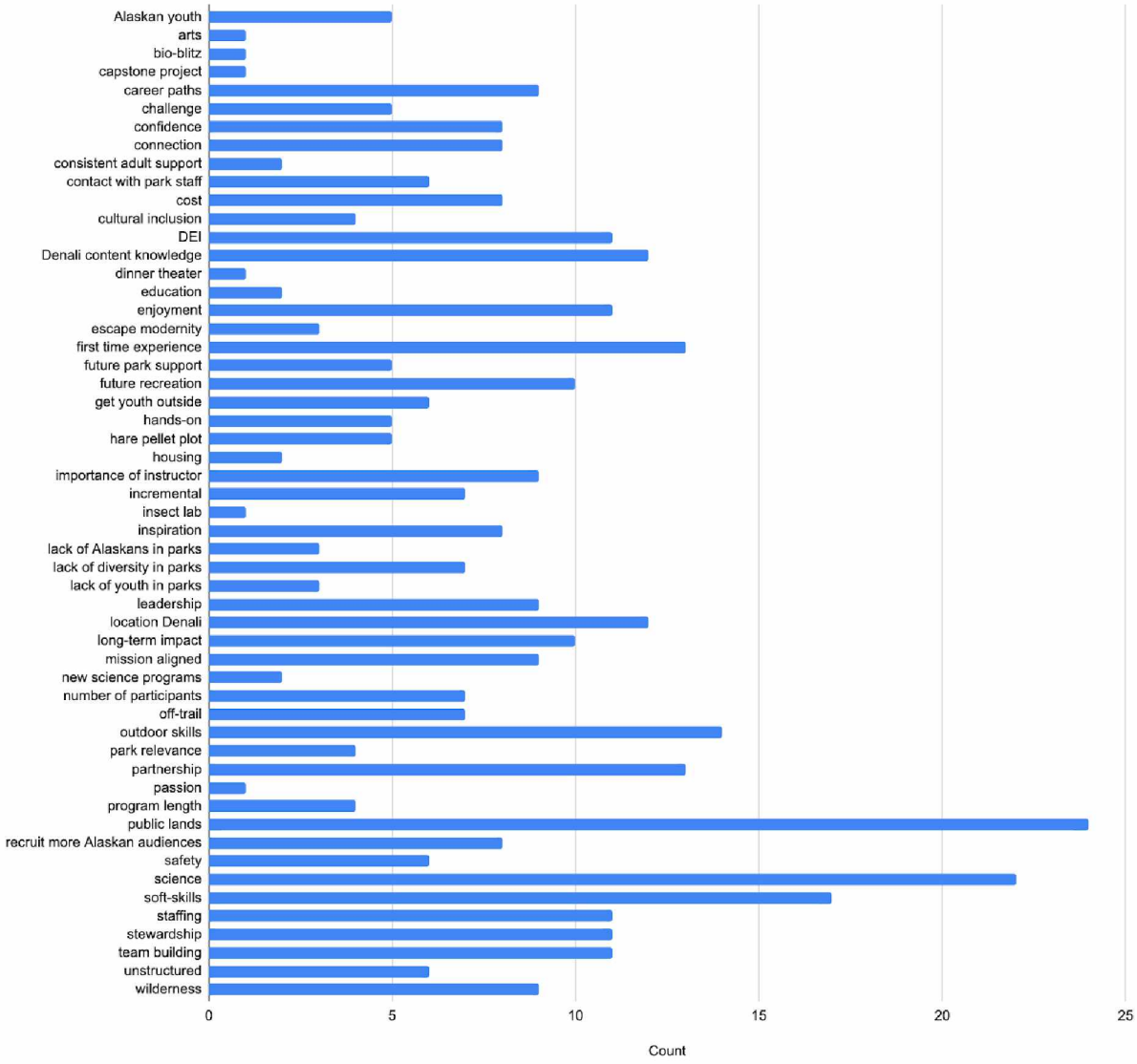
Brainstorm a list of words that come to mind when you think of [insert central concept here]. Once you have a list you are happy with, think about how you could group some of your words together. Are there concepts or categories that describe how you grouped your words?
Use your categories and word list to create a concept map around the central concept.   
Compare your concept maps from the first and last day. What do you think is the biggest difference?

Appendix B: Part I-All Codes

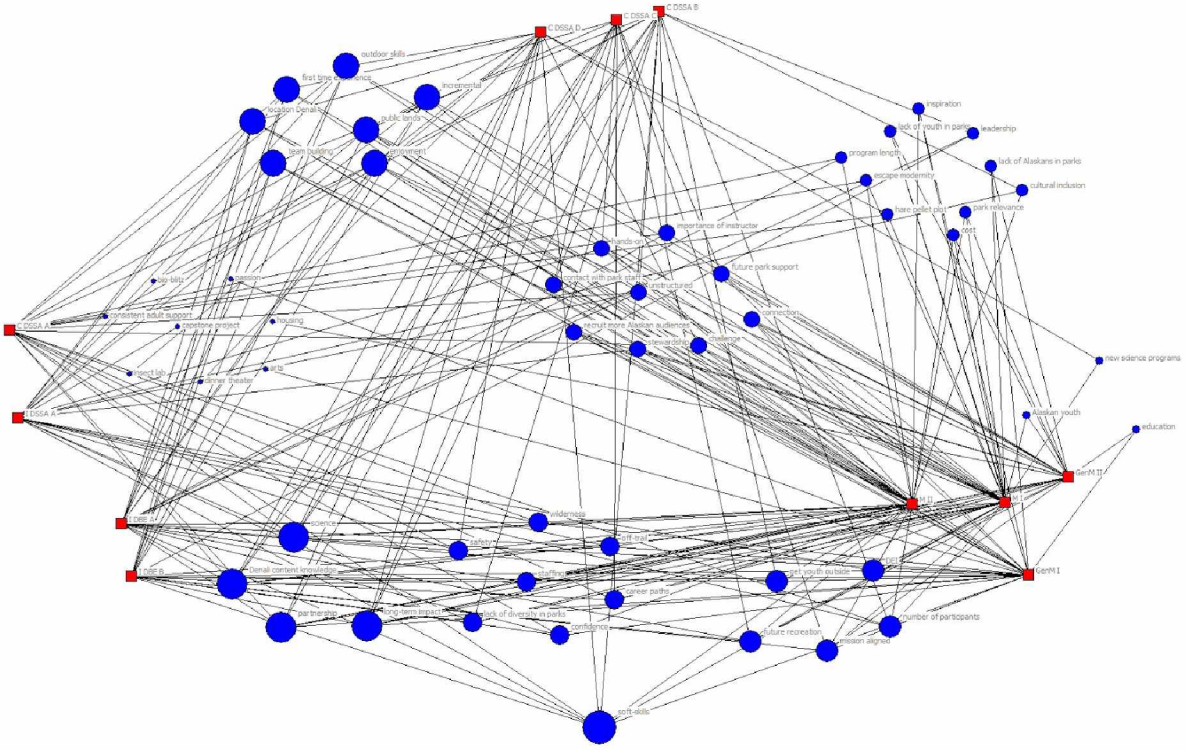
All Codes Organized by Logic Model Categories

Resources/Inputs	Program Activities	Outcomes	Impacts
Management	**Content**	**General**	future park support
cost	arts	connection	future recreation
housing	bio-blitz	education	long-term impact
partnership	capstone project	enjoyment	park relevance
Place	career paths	escape modernity	public lands
location Denali	Denali content knowledge	get youth outside	stewardship
off-trail	dinner theater	inspiration	
wilderness	hare pellet plot	passion	
Participants	insect lab	**Social/Emotional Development**	
Alaskan youth	new science programs	confidence	
DEI	outdoor skills	leadership	
first time experience	science	soft-skills	
lack of Alaskans in parks	**Process**	team building	
lack of diversity in parks	challenge		
lack of youth in parks	hands-on		
number of participants	incremental		
recruit more Alaskan audiences	program length		
Adult Leads	safety		
consistent adult support	unstructured		
contact with park staff	mission-aligned		
importance of instructor			
staffing			

Codes are organized into four columns aligning with the logic model I developed to visualize program structure. Input subcategories include resources that are governed by management like cost and housing availability, the place of Denali as an influence for place-based education, the participants who have been involved or will be recruited to the program, and the adults who work directly with the students. Program Activity subcategories address either specific content or the general process in which the content is instructed. Outcomes highlight general experiences and dispositions as well as a suite of soft-skills youth may development. Impact codes regard attitudes or behaviors that might develop over months or years after the program.



Frequency of All Codes Among All Interview Participants



Network of All Codes and All Interview Participants Arranged by Degree

Appendix B: Part II-Codebook

Main Category	Sub-Themes	Codes	Code Definition	Code Example
Resources /Inputs	**Management Concerns**	cost	There is a reference to the cost of running the program for management and participants.	"They [DBEs] are so expensive, oh my gosh! It's just the staffing time is just tremendously intensive."
		housing	There is a reference to how housing staff influences how programs operate.	"We're working on developing housing there so we can… get good people and provide a way that they can be there, live comfortably, and you know deliver these great programs."
		partnership	Mention of how these programs operate because of partnerships between different organizations.	"A big one for me as a manager and someone that looks for partnerships and collaborations that can add stability and strength, is our venture into only doing these programs with existing organizations that have a youth component."
	Place-Based	location Denali	Discussion revolves around how being in Denali in particular is relevant to the program.	"We get to use every aspect of what makes Denali a gem in our National Park system to our advantage in how we present it to the students with whom we work... The Denali Summer Science Academy could not occur in such a positive way were it not happening in that place."
		off-trail	Mention of being in an off-trail or backcountry environment.	"So there are no trails, no certain campsites, or no one telling you where to go."
		wilderness	Interviewee specifically references the concept of wilderness while describing the program.	"I think that students, um, in that kind of the vulnerability of the growth moment, the grandeur and power of a wilderness becomes clear to them."
	Participants	Alaskan youth	Mention of the program targeting Alaskan youth.	"Our objective is for Alaskan youth, and connecting Alaskan youth with the park, that's certainly one."
		DEI	Interviewees address diversity, equity, and inclusion in regards to participants and development of program components.	"We do try to recruit youth that come from environments where they don't necessarily have the support to ever do something like this."

		first time experience	There is a reference to have participants get to experience something new during the trip.	"They take away, just even just an exposure to something new. Yeah, be it that they've never camped before, or never slept in a tent..."
		lack of Alaskans in parks	Mention of how Alaskans often don't visit public lands in general, or National Parks specifically.	"We recognize that most people visiting Alaska's public lands are not Alaskans."
		lack of diversity in parks	Mention of how visitors to National Parks and public lands do not represent diverse backgrounds.	"It's hard because the Park Service is really white and environmental ed in general is really white..."
		lack of youth in parks	Mention of a lack of youth representation in public lands visitors.	"Most of the people using public lands today are older and more affluent"
		number of participants	A discussion about the number of participants in a program, either how the small numbers benefit the program, or a discussion of changing the number of participants.	"My biggest sorrow with all this is that we had 20 kids at our second camp this year, and there's no way we can take all of them to Denali."
		recruit more Alaskan audiences	Interviewee expresses a goal of bringing in more Alaskan audiences into public lands.	"I would love to see increased partnerships with school districts, both in Alaskan cities as well as rural areas, to be able to connect students with (our) national park and other park lands in Alaska."
	Adult Leaders	consistent adult support	One interviewee expressed a specific desire for the programs to show youth participants that the adult leaders were consistent, reliable adults that cared for the kids.	"We want to be long term stable adults, living functional lives, that can help be role models for the kids."
		contact with park staff	Mentions of meeting with experts in the field during the program.	"The direct approach of having students, young people, be interacting with scientists"
		importance of instructor	Discussion surrounds how the instructors themselves are integral parts of programmatic success.	"The best part was just the ease with which the instructors, um blended into our group"

		staffing	Instead of mentions of the instructor as an important part of the program, staffing concerns deal with the hiring, and organizational structure of staff.	"It's just the staffing time is just tremendously intensive."

Program Activities	**Specific Program Content**	arts	One interviewee mentioned art as a new content area to address in programs.	"Maybe there are some opportunities for some of these programs to focus more on the arts"
		bio-blitz	One interviewee mentioned bio-blitz as a favorite activity.	"The kids were so into bio-blitzing, it was insane."
		capstone project	One interviewee mentioned the desire to create a capstone project as a new activity.	"There needs to be a capstone project."
		career paths	Mentions of career paths in public lands as a program component or impact.	"It allows students to actually envision whether or that is a career path that they would want to be involved"
		Denali content knowledge	Interviewees discuss how content specific to Denali (science, history, etc.) is shared. Can be a positive or negative opinion about whether this is useful information to share.	"I guess another goal would just be knowledge of the park, which...there's less emphasis of that, only because there's just not a lot of time in the day to sit down and talk about a full, you know, history lesson of Denali National Park."
		dinner theater	One interviewee mentioned dinner theater as a new activity to offer.	"This last year we did dinner theater, we did the dinner theater, not that that's necessarily a viable thing, but it was kind of fun."
		hare pellet plot	The hare pellet surveys are referenced as an activity that students participated in.	"Like going out to do the hare poop plots for example"
		insect lab	The entomology lesson is referenced as an activity that students participated in.	"I think the insect night, with looking at insects through a microscope was phenomenal."
		new science programs	Interviewees discuss how the program could evolve by adding in new scientists or new science studies.	"I would love to get where we have other projects like that, where the scientists have gotten used to trusting us, that we, we'll bring citizen scientists, on a regular basis to help with their projects."

		outdoor skills	Outdoor skills such as hiking, backpacking, camping, etc. are mentioned while describing what students do during the program or take away from the program.	"They have to learn all these skills to just be able to do their daily tasks, setting up a tent, and cooking, and sharing chores, and filtering water, all of that kind of thing."
		science	Science as a major content area is referenced. Sometimes science is mentioned in general, sometimes ecology, natural history, or other disciplines are mentioned specifically. Some are in favor of science education, some see it as a less important program component.	"Exposure to field science is great at that age, very beneficial for them, and exposure to field science in the national park is hugely beneficial as well, and, when you realize how much good science is happening in this national park, and if it's not being used in the education of our high schoolers it's a huge loss that someone could go to high school in Fairbanks or Anchorage and their textbooks are covering some older dry science, not practical to Alaska."
	General Process of Program Instruction	challenge	The inherent nature of the program structure involves students facing a challenge or something they might not be comfortable with.	"It is very common for students to get strongly shaken from their comfort zone"
		hands-on	Specific mention to the hands-on nature of the program.	"They have the opportunity to do some hands-on science with active scientific research which I think is kind of unique and awesome."
		incremental	Discussing how the program has to start off with small steps to meet students needs before advancing to more challenging activities.	"I am proud of how we have created a kind of a net, a safety net for a slow entry into knowing what the students are going to experience, we have a full, almost two days, and evening, day and a morning of preparation for going out into the field."
		program length	Some reference is made to the length of the program.	"If the trips could be longer, even double the length."
		safety	The importance of safety as part of program structure is referenced.	"Ok it's safe, we're close to vehicles, so that they take away the challenge element, of like, alright I've never done this, or I've never done that..."
		unstructured	Discussion or mention of how the programs don't have a rigorous structure that is overloaded with pre-planned activities.	"One thing that really stood out to this one... was the amount of kind of unstructured time, you know. Too often in environmental ed programs, and outdoor ed programs, we try to really structure the time and over-play it."

		mission-aligned	Discussion of how the programs are aligned with the missions of any of the participating organizations.	"There's the mission of the National Park Service to provide opportunities for people to gain, to be educated, inspired and gain enjoyment in our national parks. And so really, these youth programs allow students access to education, inspiration, and recreation in these sites..."

Outcomes	**General**	connection	Reference to the framework of connection to nature as an outcome or objective of the program.	"The main objective is to have more Alaskan youth connected with and appreciating the National Parks that they have right here in their backyard."
		education	Mention of how students will receive education in general as part of youth programs.	"Providing strong educational experiences for area students, that fits into both national and park specific goals and long-term strategy."
		enjoyment	Mention of participants having fun, liking, or enjoying the program.	"They all had clearly very much enjoyed it."
		escape modernity	Belief that students get a benefit from just being outside away from modern stresses.	"Not have to stress about all these other things. And I think being away, further away physically... is helpful for that."
		get youth outside	Basic outcome that students just get to spend time outside.	"You know, I would hope that all students benefit by being inspired by having an in-person, hands-on experience in nature."
		inspiration	Mention that students will or should find inspiration from the program.	"I would say the main objectives are to inspire young people to care about the natural world..."
		passion	Mention that students will develop a passion for Denali or the outdoors.	"It is very clear that they have all fallen in love with the Denali wilderness.
	Social/ Emotional Development	confidence	Explicit discussion of objectives or take aways involving students gaining confidence.	"My main hope was that it would make them more confident."
		leadership	Discussion of objectives, takeaways, or instructional components involving leadership development.	"It seems most beneficial toward passing on leadership development skills while using these trips as a medium."

		soft-skills	General discussion of soft-skills, or specific mention of soft-skills other than confidence, leadership, and team building. Soft-skills involved anything dealing with social-emotional development, or life-skills rather than concrete outdoor skills or content knowledge.	"And the other part of that is social-emotional development, soft skill development doing all of this, again, within the place of Denali, is a huge component."
		team building	Discussion of objectives or take aways involving team development.	"Oftentimes it's the rain, it's the river crossings, it's: we came across a bear that those types of things and how they individually and as a group worked together offered some great lessons."

Long-Term Impacts	*No Sub-Theme*	future park support	Interviewees express a desire to have participants become future park supporters.	"So that's really one of the main objectives, is to connect with Alaskan youth and make these parks relevant and in turn grow the constituency for what these parks can offer Alaskans."
		future recreation	Known or desired impact for participants to continue outdoor recreation, ideally on public lands.	"So all of those elements so that hopefully they were enticed to want to come back and do it again."
		long-term impact	Stories are shared about perceived impacts on participants from past seasons, or interviewees share guesses on possible long-term impacts.	"And then she also applied for another girls' science expedition kind of trip... And she asked me for a letter of recommendation. So she was, like very interested in continuing this kind of adventuring and leadership experience."
		park relevance	There is a desire that programs help students feel like National Parks and public lands are relevant to their own lives.	"That's where these, these examples that we've tried to implement into that program, as relevant to their own backyard, as something they'll see and understand, like snowshoe hares or whatever."
		public lands	This broad category represents a vast swatch of opinions and emotions related to perceptions about public lands in general. Sub -categories include basic exposure to public lands, how public lands are managed, how to visit public lands, and the role of science on public	"The broadest piece that we're hoping to deliver is appreciation for public lands."

			lands.	
		stewardship	Hope that participants learn a sense of stewardship for the environment, or what it means to protect the environment.	"And it is very clear that they have all fallen in love with the Denali wilderness. And that that is such a critical step in building stewardship ethics in students and in young people."

Appendix B: Part III-Codes Organized by Stakeholder Group

Comparing Codes by Frequency and Degree for General Managers

	GenM I	GenM II	**Frequency**	**Degree**
Alaskan youth	0	1	**1**	**1**
arts	1	0	**1**	**1**
career paths	0	1	**1**	**1**
confidence	1	0	**1**	**1**
connection	1	2	**3**	**2**
cost	0	3	**3**	**1**
DEI	2	2	**4**	**2**
education	1	1	**2**	**2**
enjoyment	2	1	**3**	**2**
future park support	1	3	**4**	**2**
future recreation	0	1	**1**	**1**
get youth outside	1	1	**2**	**2**
housing	0	2	**2**	**1**
inspiration	1	0	**1**	**1**
importance of instructor	0	1	**1**	**1**
incremental	0	1	**1**	**1**
lack of Alaskans in parks	1	1	**2**	**2**
lack of diversity in parks	0	1	**1**	**1**
lack of youth in parks	1	1	**2**	**2**
location Denali	1	0	**1**	**1**
long-term impact	1	1	**2**	**2**
mission aligned	1	1	**2**	**2**
number of participants	1	0	**1**	**1**
off-trail	1	0	**1**	**1**
outdoor skills	0	1	**1**	**1**
park relevance	0	1	**1**	**1**
partnership	1	3	**4**	**2**
passion	1	0	**1**	**1**
public lands	3	4	**7**	**2**
recruit more Alaskan audiences	2	2	**4**	**2**
science	1	0	**1**	**1**
soft skills	2	0	**2**	**1**
staffing	0	2	**2**	**1**
stewardship	2	3	**5**	**2**

team building	2	0	**2**	**1**
wilderness	2	0	**2**	**1**

All codes that were assigned to both general managers are highlighted.

- Codes in bright orange were assigned to both managers at the highest frequency.
- Codes in light orange were assigned to both at least four times cumulatively.
- Codes highlighted in gray were assigned to both but only once each, or once by one and twice by the other manager.

Comparing Codes by Frequency and Degree for Direct Managers

	M I	M II	**Frequency**	**Degree**
Alaskan youth	4	0	**4**	**1**
career paths	3	0	**3**	**1**
challenge	1	2	**3**	**2**
confidence	0	2	**2**	**1**
connection	4	1	**5**	**2**
contact with park staff	1	1	**2**	**2**
cost	3	2	**5**	**2**
cultural inclusion	0	1	**1**	**1**
DEI	3	1	**4**	**2**
Denali content knowledge	1	1	**2**	**2**
enjoyment	1	1	**2**	**2**
escape modernity	1	1	**2**	**2**
first time experience	1	1	**2**	**2**
future park support	1	0	**1**	**1**
future recreation	1	2	**3**	**2**
get youth outside	0	1	**1**	**1**
hands-on	1	1	**2**	**2**
hare pellet plot	3	0	**3**	**1**
incremental	0	1	**1**	**1**
inspiration	1	6	**7**	**2**
lack of Alaskans in parks	1	0	**1**	**1**
lack of diversity in parks	2	0	**2**	**1**
lack of youth in parks	1	0	**1**	**1**
location Denali	1	3	**4**	**2**
long-term impact	2	1	**3**	**2**
mission aligned	3	2	**5**	**2**
new science programs	1	0	**1**	**1**
number of participants	1	2	**3**	**2**
off-trail	0	1	**1**	**1**

outdoor skills	1	0	**1**	**1**
park relevance	2	1	**3**	**2**
partnership	2	1	**3**	**2**
program length	0	2	**2**	**1**
public lands	3	5	**8**	**2**
recruit more Alaskan audiences	2	2	**4**	**2**
safety	0	2	**2**	**1**
science	3	3	**6**	**2**
soft-skills	1	4	**5**	**2**
staffing	3	3	**6**	**2**
stewardship	0	5	**5**	**1**
team building	1	3	**4**	**2**
wilderness	0	3	**3**	**1**

All highlighted codes were assigned to both direct managers, showing a great degree of overlap between how these two direct managers discussed programs.

- Codes highlighted in bright orange show those codes with the highest frequency that were mentioned by both managers.
- Codes in light orange have a frequency of five.
- Codes in blue have a frequency of four.
- Codes highlighted in gray have a frequency of two or three.

Comparing Codes by Frequency and Degree for Instructors

	I DSSA A	I DBE A	I DBE B	**Frequency**	**Degree**
capstone project	1	0	0	**1**	**1**
career paths	0	0	1	**1**	**1**
confidence	0	3	1	**4**	**2**
cultural inclusion	1	0	0	**1**	**1**
DEI	1	0	2	**3**	**2**
Denali content knowledge	0	1	0	**1**	**1**
enjoyment	0	1	0	**1**	**1**
first time experience	1	2	3	**6**	**3**
future recreation	0	2	3	**5**	**2**
get youth outside	0	1	1	**2**	**2**
hands-on	2	0	0	**2**	**1**
importance of instructor	0	3	0	**3**	**1**
incremental	1	0	1	**2**	**2**
lack of diversity in parks	1	0	2	**3**	**2**
leadership	0	5	3	**8**	**2**
location Denali	3	3	1	**7**	**3**
long-term impact	0	0	1	**1**	**1**
mission-aligned	0	0	1	**1**	**1**

number of participants	1	0	0	**1**	**1**
off-trail	1	3	1	**5**	**3**
outdoor skills	3	4	3	**10**	**3**
public lands	3	0	2	**5**	**2**
partnership	0	1	0	**1**	**1**
program length	0	1	0	**1**	**1**
safety	1	1	0	**2**	**2**
science	5	0	0	**5**	**1**
soft-skills	1	4	1	**6**	**3**
staffing	0	2	1	**3**	**2**
stewardship	1	0	0	**1**	**1**
team building	1	1	2	**4**	**3**
unstructured	1	1	0	**2**	**2**
wilderness	2	1	0	**3**	**2**

- Codes highlighted in bright orange were assigned to all three instructors with the highest frequency.
- Codes in blue were also assigned to all three instructors but with lower frequencies.
- Codes in pink were assigned frequently, but only to one or two of the instructors.

Comparing Codes by Frequency and Degree for Chaperones

	C DSSA A	C DSSA B	C DSSA C	C DSSA D	**Frequency**	**Degree**
bio-blitz	0	1	0	0	**1**	**1**
career paths	1	0	3	0	**4**	**2**
challenge	1	0	0	1	**2**	**2**
confidence	1	0	0	0	**1**	**1**
consistent adult support	0	2	0	0	**2**	**1**
contact with park staff	0	1	3	0	**4**	**2**
cultural inclusion	0	2	0	0	**2**	**1**
Denali content knowledge	3	2	1	2	**8**	**4**
dinner theater	0	0	0	1	**1**	**1**
enjoyment	3	0	0	2	**5**	**2**
escape modernity	1	0	0	0	**1**	**1**
first time experience	1	0	0	4	**5**	**2**
future park support	0	0	1	0	**1**	**1**
future recreation	0	0	1	0	**1**	**1**
get youth outside	0	1	0	0	**1**	**1**
hare pellet plot	1	0	0	1	**2**	**2**
hands-on	0	0	1	0	**1**	**1**
importance of instructor	3	2	0	0	**5**	**2**
incremental	1	0	0	1	**2**	**2**
insect lab	0	0	0	1	**1**	**1**

lack of diversity in parks	0	1	0	0	**1**	**1**
leadership	0	1	0	0	**1**	**1**
location Denali	0	0	1	0	**1**	**1**
long-term impact	0	1	2	1	**4**	**3**
mission aligned	0	0	1	0	**1**	**1**
number of participants	1	1	0	1	**3**	**3**
new science programs	0	0	0	1	**1**	**1**
outdoor skills	1	0	0	1	**2**	**2**
partnership	1	0	1	2	**4**	**3**
program length	1	0	0	0	**1**	**1**
public lands	0	0	4	0	**4**	**1**
safety	1	0	0	1	**2**	**2**
science	2	3	3	2	**10**	**4**
soft-skills	1	1	0	1	**3**	**3**
unstructured	3	1	0	0	**4**	**2**
wilderness	1	0	0	0	**1**	**1**

- Codes assigned to all four chaperones are highlighted in bright orange.
- Codes in green were assigned to three of the chaperones.
- Codes in pink were assigned to only two chaperones, but still have a relatively high frequency of five.

Top Codes by Frequency and Degree for the Four Stakeholder Types

Chaperones:

	C DSSA A	C DSSA B	C DSSA C	C DSSA D	**Frequency**	**Degree**
Denali content knowledge	3	2	1	2	**8**	**4**
science	2	3	3	2	**10**	**4**
enjoyment	3	0	0	2	**5**	**2**
first time experience	1	0	0	4	**5**	**2**
importance of instructor	3	2	0	0	**5**	**2**
long-term impact	0	1	2	1	**4**	**3**
number of participants	1	1	0	1	**3**	**3**
partnership	1	0	1	2	**4**	**3**
soft-skills	1	1	0	1	**3**	**3**

Instructors:

	I DSSA A	I DBE A	I DBE B	**Frequency**	**Degree**
first time experience	1	2	3	**6**	**3**
location Denali	3	3	1	**7**	**3**
outdoor skills	3	4	3	**10**	**3**
soft-skills	1	4	1	**6**	**3**

future recreation	0	2	3	**5**	**2**
leadership	0	5	3	**8**	**2**
public lands	3	0	2	**5**	**2**
science	5	0	0	**5**	**1**
off-trail	1	3	1	**5**	**3**
team building	1	1	2	**4**	**3**

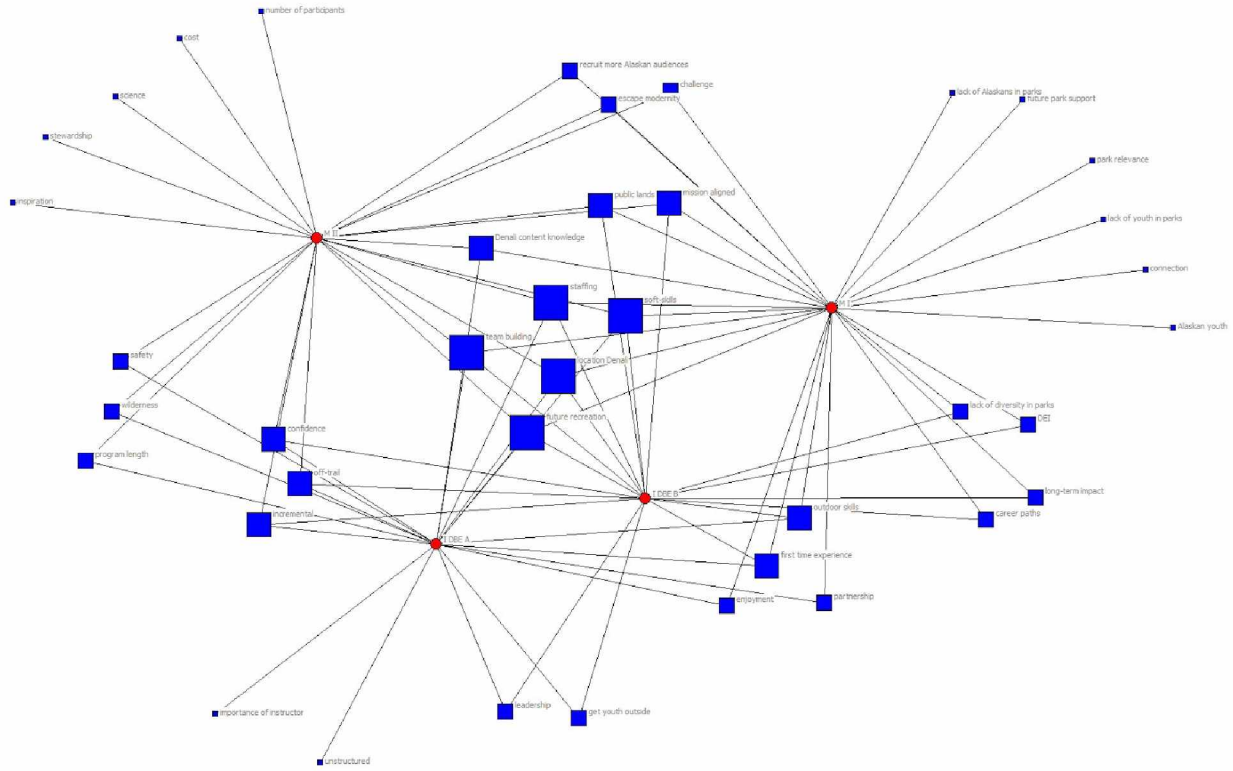
Direct Managers:

	M I	M II	**Frequency**	**Degree**
inspiration	1	6	**7**	**2**
public lands	3	5	**8**	**2**
science	3	3	**6**	**2**
staffing	3	3	**6**	**2**
connection	4	1	**5**	**2**
cost	3	2	**5**	**2**
mission aligned	3	2	**5**	**2**
soft-skills	1	4	**5**	**2**
DEI	3	1	**4**	**2**
recruit more Alaskan audiences	2	2	**4**	**2**
team building	1	3	**4**	**2**

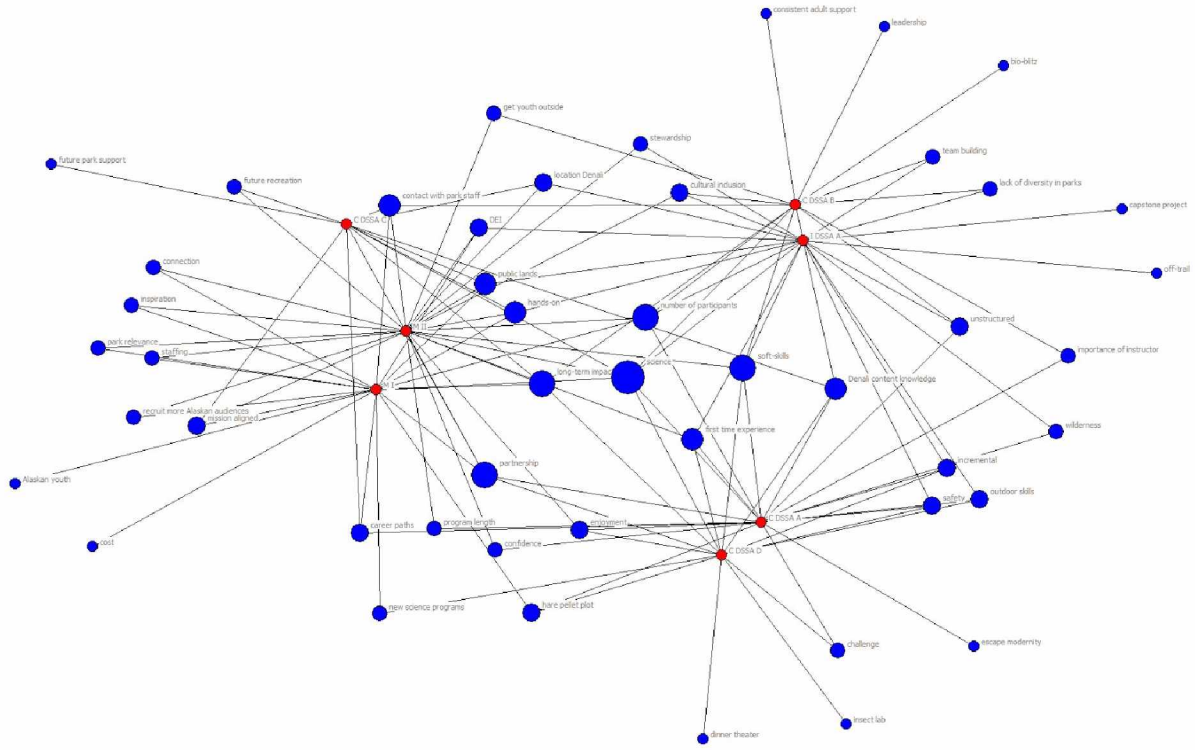
General Managers:

	GenM I	GenM II	**Frequency**	**Degree**
public lands	3	4	**7**	**2**
stewardship	2	3	**5**	**2**
DEI	2	2	**4**	**2**
future park support	1	3	**4**	**2**
partnership	1	3	**4**	**2**
recruit more Alaskan audiences	2	2	**4**	**2**

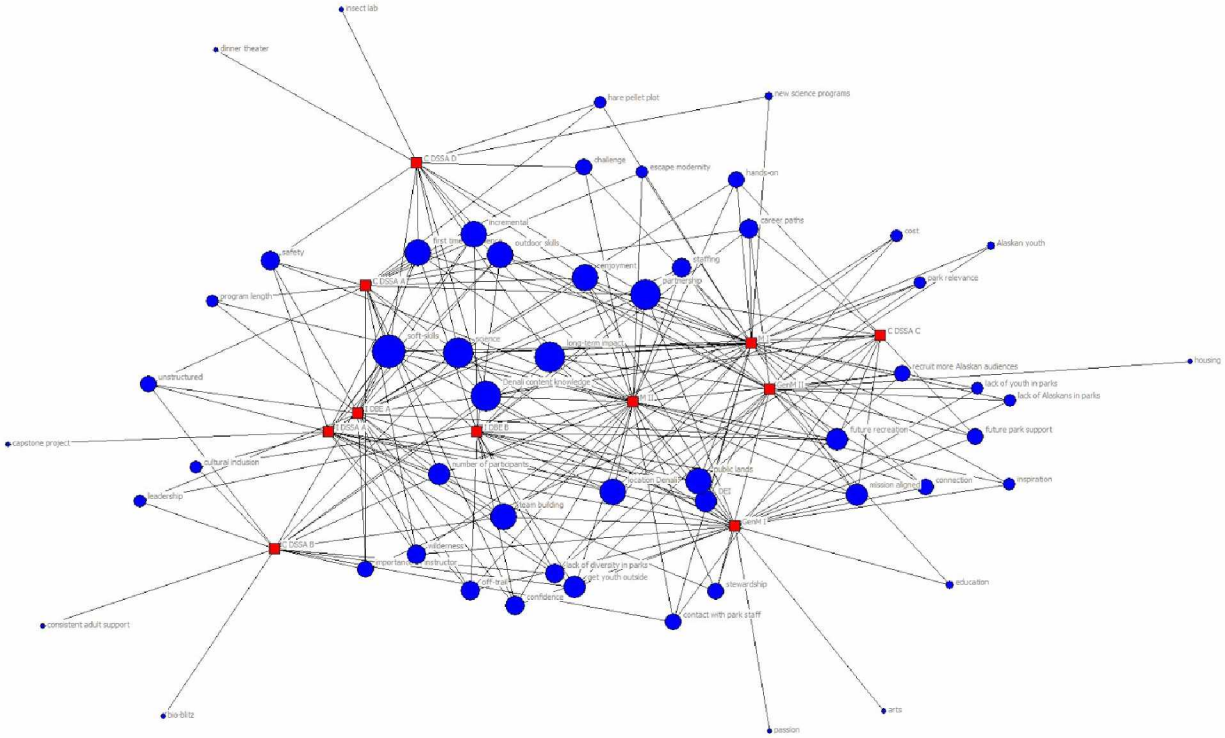
Appendix C: Social Network Analysis



DBE Network: Two DBE instructors and two direct manager codes are all compared. Blue codes with the highest degree are central and larger than codes with lesser degrees. The two instructors and two managers are shown in red.



DSSA Network: One DSSA instructor, four DSSA chaperones, and two direct managers, all seen in red, are compared in this network. Codes with the highest degree are shown larger in blue.



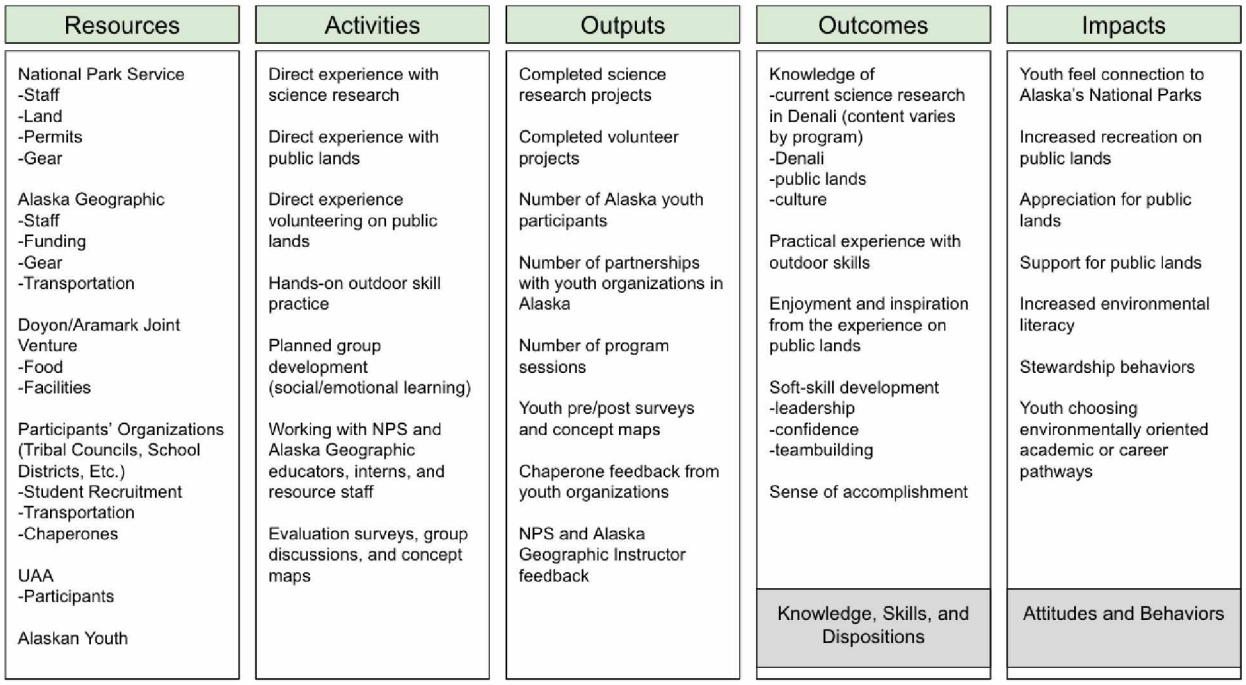
All eleven stakeholders interviewed are shown as red squares. The codes in blue are larger if they were assigned to more people. There is overlap in how types of stakeholders discuss these programs. No interviewee is an extreme outlier.

Appendix D: Table of Goals and Objectives

Goal Categories	Instruction-Focused Activity Goals	Intermediate Outcomes/ Objectives for Students	Guiding Evaluation Questions
Personal Growth and Social/Emotional Development	Offer experiences allowing for personal growth and leadership development.	At the end of the program, students will be able to identify at least one area of personal growth in their post program evaluations. Students will experience something new.	Do participants self identify as having experienced personal growth through the trip? If yes, what do they attribute this growth to?
Outdoor Skills	Offer opportunities for youth to develop outdoor skills through hands-on experiences.	During the program, students will demonstrate competence in outdoor skills by setting up campsites, hiking as a group, responding to wildlife, explaining leave no trace principles, etc. (Follow up long-term outcome would be that students have the skills and abilities to recreate on their own.)	What outdoor skills are youth introduced to through the program? Do they think they will use these skills in the future?
Knowledge of Denali National Park and Preserve	Provide opportunities to learn about content specific to Denali National Park and Preserve, including, when relevant, hands-on field science.	Students will be able to discuss at least one new thing they learned about Denali National Park and Preserve through group discussions and in their post program evaluations.	Are students learning any content specific to Denali National Park and Preserve (history, science, how to visit, etc.)?
Knowledge of Public Lands	Build awareness about public lands through instruction about public lands: what they are, how they are managed, the role of science, and how to access them.	During the program, students will be able to define what public lands are and explain either how to access public lands, how science plays a role in protecting public lands, or how public lands are managed through group discussions. (Follow up long-term outcome would be participants become users and advocates of public lands, potentially even employees of public lands.)	Have participants increased their knowledge about public lands and can they describe what public lands are? Are participants aware of how to access their public lands? How public lands are managed? How science plays a role in protecting public lands?
Environmental and Public	Provide opportunities for positive connections to public lands in the hopes of fostering	Students will have positive memories associated with their experience in Denali. Students	Do participants have positive attitudes about

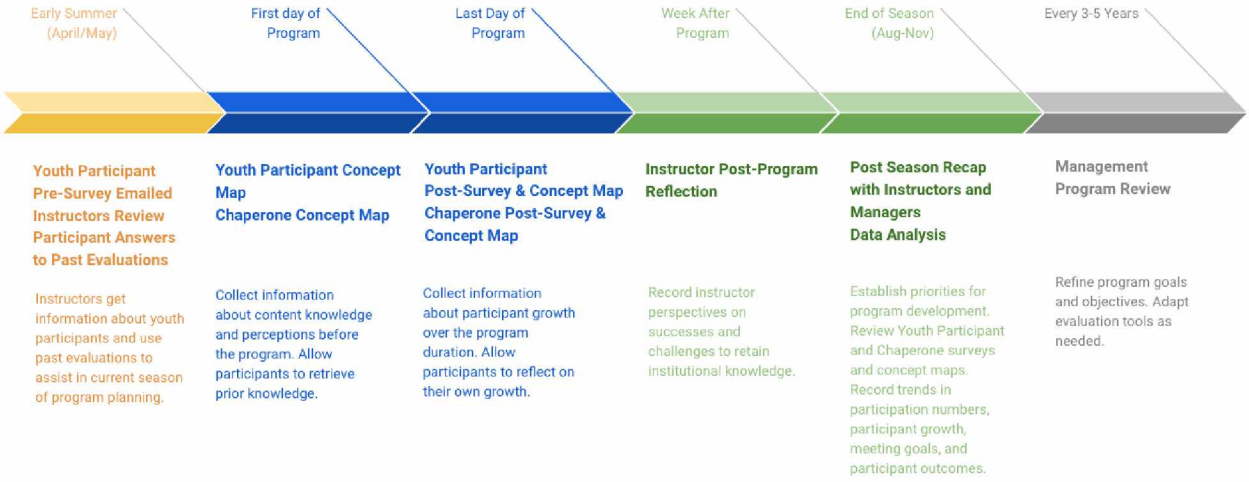
Lands Attitudes and Behaviors	future pro-environmental behavior and future support of public lands. Specifically, instructors will develop schedules that incorporate a variety of recreation and learning opportunities in Denali in an attempt to create positive connections between students and public lands.	express enjoyment and inspiration from their time in Denali and intention to return to public lands.	Denali and other public lands?
Knowledge of Cultural Content on Public Lands	Provide platform for students and staff to discuss cultural tensions on public lands. Specifically, instructors will acknowledge the indigenous heritage of the lands Denali National Park and Preserve occupies during introductory activities. At the end of the program, staff will be able to discuss at least one new perspective they learned about youth and/or cultural perspectives regarding our public lands.	During the program students will discuss cultural tensions they have observed on public lands.	Are participants aware of cultural heritage and cultural tensions in National Parks and other public lands? Do they feel like they have a voice to discuss their place in public lands?
Expanding Participation	Provide opportunities for Alaskan youth to experience Alaskan National Parks. Develop partnerships with other youth programs in Alaska and offer low or no cost programs to open this opportunity to more students. Specifically, managers (and instructors) will create and maintain partnerships with outside organizations to bring in youth groups from diverse backgrounds over a broad geographic spectrum of Alaska and develop plans to offer programs at low or no-cost to participants.		What percent of participants have been to Denali? How many partnerships have been developed to bring in youth groups? Do participants represent a diversity of Alaskan youth in regards to ethnicity and geographic location?

Appendix E: Logic Model for MSLC Programs for High School and College Audiences



Appendix F: Part I: User Manual for Evaluation Data Collection and Analysis

Evaluation Timeline:



Data Analysis Plan:

Look at DBE and DSSA independently using the same methods for analyzing data. For the DBE program, there will not be data from chaperones unless a representative from UAA or UAF joined the program, or worked closely with preparing and debriefing with the students and was given a Post-Survey to complete. After analyzing data separately for each program, compare trends. There may be elements from each program that can inform improvement for the other.

Analysis To Be Performed	Where to Find Data	How to Use Data
Assess how the programs are meeting current goals.		
Assess how the programs are meeting goals 1-6.	**Youth Participant Pre and Post-Surveys** **Chaperone Post-Survey** **Concept Maps** **Instructor Post-Program Reflection - Goal Assessment** *Utilize Appendix F: Part II to determine specific*	**Data Organization:** For each goal, create a document to aggregate relevant data. Managers can organize data or delegate to instructional staff. First, from the youth participant pre and post-surveys, locate the Likert rating questions relevant to each goal category. Find the statements that align with each goal in Appendix F: Part II. Google Forms creates charts that show distribution of answers from strongly disagree to strongly agree. Download the charts from the pre and post-surveys into the documents for each goal.

	questions from each evaluation tool listed above that are relevant to each goal. **Post-Season Recap for Instructors and Managers**	Insert the pre chart above the post to facilitate comparison between the pre and post answers to each statement to see if there is any shift toward agreement on any of the statements after the program. Next, add relevant open response answers from chaperone post-surveys and instructor goal assessments to each goal document. Find which open response questions are aligned with each goal in Appendix F-Part II. Organize answers under each relevant open response question. For goals 2,3 and 4, gather percentages from youth participant pre-survey rankings about how often they had participated in listed activities. Look to Appendix F: Part II for relevant statements for each of these goals. **Data Analysis:** Bring all goal data documents to the Post-Season Recap for Instructors and Managers. For each goal, discuss how programs are meeting the goal. Look at youth participant Likert ratings and identify if there is any trend toward agreement for statements related to each goal category. Have all participants at the Post-Season Recap read open response answers related to each goal and identify any common trends in answers. As a group, look at the concept maps from youth and chaperones. Again, have all participants at the Post-Season Recap look for trends related to each goal. Identify categories on concept maps related to each goal. Look for trends among all concept maps categories and write-ups about how participants perceived change in their concept maps. Are there any goals that aren't represented in the pre-concept maps, but appear after the program? Consider if the concept maps, Likert ratings, and open response questions share any common trends to help identify areas of success or room for improvement. Compile notes from the Post-Season Recap about staff opinions about success and relevance of each goal and any common trends identified from the data during the meeting. During the winter season,

		managers can review the goal data documents again by adding notes of observed trends in open response answers and whether Likert ratings show any sign of student growth over the program. Compare this review and Post-Season Recap notes to establish priorities for program development.
Track participant information. (Goal 7)		
Track number of participants.	**Instructor Post-Program Reflection: Program Snapshot:** *Question: "How many students were on your trip?"*	Record how many total participants were on the DBE program. Record how many total participants were on the DSSA program. Record how many groups were under-enrolled.
Record ethnicities of participants.	**Youth Participant Pre-Survey:** *Question: "Which cultural or ethnic group(s) do you identify with?" Question: "If you identify as Alaska Native, which cultural group(s) do you identify with?"*	Use Google Forms to create a chart showing percentages of students who identify as each ethnicity.
Track how much exposure participants have had to outdoor skills and experiences before the program.	**Youth Participant Pre-Survey:** *Question: "Mark how often you have done the following activities."*	Use Google Forms summary charts to record the number of students who have never participated in each of the outdoor skills and experiences on the youth participant pre-survey. Also record how many students have selected "A few times" to describe how often they have participated. Calculate percentages of students who have never participated in each activity as well as percentages for the "never" and "a few times" categories combined to get a percentage for novices to these skills. Use these percentages to understand if the listed outdoor skills and experiences are new experiences for participants.
Analyze general feedback on program components.		
Record favorite program components.	**Youth Participant Post-Survey:** *Question: "What was your favorite part of the trip?"* **Chaperone Post-Survey:** *Question: "What is your favorite part of the program?" Question:*	Read through all responses from participants discussing program components. Make a list of all components mentioned and track any repetitions of mentions of specific program components. Discuss these survey results along with instructor and manager opinions during the Post-Season Recap. Record a list of favorite program components discussed in this meeting and compare to participant responses. Utilize these lists to assess

	"Which components of the program do you think were most successful at sharing park science and information about public lands with your students?" *Question: "Is there anything else you would like to share about the program?"* **Post-Season Recap for Instructors and Managers**	if there are specific program elements that should remain in future sessions.
Keep track of successful instructional styles.	**Instructor Post-Program Reflection:** *Question: "What instructional styles were implemented that you think helped student learning?"* *Question: "Please provide feedback on other adults who joined the group. Comment on content shared and instructional style."*	Discuss identified instructional styles and successful partnerships with other adult leaders during the Post-Season Recap. Add any identified successes to the list of favorite program components. This compiled list can help direct future instructors in program planning regarding both content and instructional techniques.
Track feedback on NPS and Alaska Geographic instructors.		
Check feedback on instructors.	**Youth Participant Post-Survey and Chaperone Post-Survey:** *Question: "Who were your instructors? Do you have any feedback on your instructors?"*	Managers can read qualitative feedback to assess if instructors are helping to create a positive experience for participants. If any specific skills or dispositions are identified, this can be used to inform hiring or professional development opportunities for instructors of youth programs.
Review feedback on program logistics.		
Review feedback on food, gear, schedules, etc.	**Instructor Post-Program Reflection:** *Question: "Do you have any comments on food, gear, scheduling, or other logistical challenges or successes?"* **Post-Season Recap with Instructors and Managers**	During the Post-Season Recap, instructors and managers should review all instructor comments about logistics from the Post-Program Reflections. Staff should use these comments as a start of a conversation about any logistical concerns or successes. Create a list of top priority changes for logistics and a list of successful elements to pass on to future instructors.
Consider opportunities for new or sustained partnerships.		

Consider partnerships.	**Chaperone Post-Survey:** *Question: "Would you like to partner with us again to bring youth into Denali? If yes, are there any changes you would like for your group if you come again next year?"* **Post-Season Recap with Instructors and Managers**	During the Post-Season Recap, staff should read chaperone comments and record a list of any actionable steps for strengthening partnerships. All staff should brainstorm ideas for new partnerships. Managers can use these ideas and other connections to forge partnerships during the winter season.
Reassess goals and objectives.		
Reassess goals.	**3-5 Year Review** **Post-Season Recaps with Instructors and Managers** **Instructor Post-Program Reflections- Goal Assessment**	Every 3-5 years, management can review notes from the past 3-5 years of Post-Season Recaps about goals. Additionally, examine instructor rankings on goals from the last 3-5 years on their Post-Program Reflection-Goal Assessment. Look for trends in goals that repeatedly have not been met. Has the program veered away from these goals? Or are these goals still relevant and programs continue to need targeted development of activities that help students meet desired outcomes? If further goal review is desired, implement another round of interviews utilizing the questions found in Appendix G.

Appendix F: Part II-How Tools Relate to Program Goals

1. Personal Growth and Social-Emotional Development

Stakeholder	Evaluation Tool	Question(s)
Youth Participants	Post Eval Open Response	Reflect on one way you feel like you grew, or challenged yourself, during this trip.
	Post Eval Pre/Post Eval Likert Ratings	I consider myself to be a leader. (Leadership) I could guide my group on a hike. (Confidence/Leadership/Self-efficacy) I think of my other group members as friends. (Team building/friendship) I can rely on others in this group if I need help. (Team building) I am excited about trying new things. (Confidence/Facing Challenges) I learn about myself when I spend time outside. (Empowerment) I feel confident in my ability to stay safe outside. (Confidence/Self-efficacy) I can take care of my basic needs while being outside all day. (Self-efficacy)
	Pre Eval Activity List	Percent of experiences the student has never participated in before.
Instructors	Post Program Reflection: Program Goals	Rating and explanation of how the program meets Goal 1: Offering opportunities for personal growth and development.
Chaperones (when applicable)	Post Eval Open Response	Please share an example of student growth you observed. What was something that you noticed was a challenge for your students?

2. Outdoor Skills

Stakeholder	Evaluation Tool	Question(s)
Youth Participants	Post Eval Open Response	What is one outdoor skill you developed or worked on that you hope to use in the future?

	Post Eval Pre/Post Eval Likert Ratings	I could guide my group on a hike. I feel confident in my ability to stay safe outside. I can take care of my basic needs while being outside all day. I have the skills to hike, backpack, or camp on my own.
	Pre Eval Activity List	Exposure to new outdoor skills measured through percent of students who selected that they never had these kinds of outdoor experiences, or only a few times.
Instructors	Post Program Reflection: Program Goals	Rating and explanation of how the program meets Goal 2: Offering opportunities for outdoor skill development.

3. Knowledge of Denali National Park and Preserve

Stakeholders	**Evaluation Tool**	**Question(s)**
Youth Participants	Post Eval Open Response	What is one new thing you learned from this trip that you think will stick with you? (This question could reveal other categories besides knowledge of Denali)
	Concept Map	Does the concept maps show any new categories related to Denali. Do their written descriptions about changes in their pre/post maps indicate increased knowledge about Denali?
	Post Eval Pre/Post Eval Likert Ratings	I can identify plants and animals in Denali. I can describe how at least one plant or animal is being studied in Denali. I am aware of different career paths to work in Denali.
	Pre Eval Activity List	How many students selected that they had never visited Denali National Park and Preserve before, or didn't know if they had visited?
Instructors	Post Program Reflection: Program Goals	Rating and explanation of how the program meets Goal 3: Provide opportunities to learn about content specific to Denali National Park and Preserve, including, when relevant, hands-on field science.
Chaperones	Post Eval Open Response	Which components of the program do you think were most successful at sharing park science and

		information about public lands with your students?
	Concept Map	Does the concept maps show any new categories related to Denali. Do their written descriptions about changes in their pre/post maps indicate increased knowledge about Denali?

4. Knowledge of Public Lands

Stakeholder	**Evaluation Tool**	**Question(s)**
Youth Participants	Post Eval Open Response	How would you like to use public lands in the future?
	Concept Map	Does the concept maps show any new categories related to public lands. Do their written descriptions about changes in their pre/post maps indicate increased knowledge about public lands?
	Post Eval Pre/Post Eval Likert Ratings	I know what public lands there are in Alaska.
	Pre Eval Activity List	How many students selected that they had never visited public lands before, or didn't know if they had visited public lands?
Instructors	Post Program Reflection: Program Goals	Rating and explanation of how the program meets Goal 4: Build awareness about public lands through instruction about public lands, what they are, how they are managed, the role of science, and how to access them.
Chaperones	Post Eval Open Response	Which components of the program do you think were most successful at sharing park science and information about public lands with your students?
	Concept Map	Does the concept maps show any new categories related to public lands. Do their written descriptions about changes in their pre/post maps indicate increased knowledge about public lands?

5. Environmental and Public Lands Attitudes and Behaviors

Stakeholder	**Evaluation Tool**	**Question(s)**
Youth Participants	Post Eval Open Response	How would you like to use public lands in the future?

	Concept Map	Look for behaviors and attitudes included in pre/post concept maps. How are students conceptualizing their actions and emotions about the environment, Denali or public lands?
	Post Eval Pre/Post Eval Likert Ratings	I enjoy spending time outside. I feel inspired when I am in nature. I would like to spend more time on public lands (National Parks, National Wildlife Refuges, National Forests, etc.)
Instructors	Post Program Reflection: Program Goals	Rating and explanation of how the program meets Goal 5: Provide opportunities for positive connections to public lands in the hopes of fostering future pro-environmental behavior and future support of public lands.

6. Knowledge of Cultural Content on Public Lands

Stakeholder	**Evaluation Tool**	**Question(s)**
Youth Participants and Chaperones	Group Discussions (informal, formative assessment)	Questions will vary by instructor.
	Concept Map	Do the concept maps show any new categories related to culture, specifically Indigenous cultures. Do participant written descriptions about changes in their pre/post maps indicate increased knowledge about culture?
Instructors	Post Program Reflection: Program Goals	Rating and explanation of how the program meets Goal 6: Acknowledge indigenous heritage of the lands programs are utilizing and discuss cultural tensions on public lands with students.

7. Expanding Participation

Stakeholders	**Evaluation Tool**	**Question(s)**
Youth Participants	Pre Eval Ethnicity	What is the distribution of participants across monitored ethnicities?
	Pre Eval Activity List	What percentage of participants are new to the listed activities?
Instructors	Post Program Reflection: Basic Report	How many students actually participated?

Chaperones	Post Eval Open Response	Would you like to partner with us again to bring youth into Denali? If yes, are there any changes you would like for your group if you come again next year?

Questions that do not fall into any of the above goal categories are concerned with tracking general logistical information (food, scheduling, transportation, etc.), general program components, and feedback on adult leaders. While not falling under the main evaluation questions, this feedback remains important for the continued improvement of the program. This basic information will also assist new instructors as surveys and reflections will retain any institutional knowledge from previous instructors and participants on successes and failures with logistical program components.

Appendix F: Part III-Description of How to Use Each Evaluation Tool

Overview:

Stakeholder	Evaluation Tools	Purpose of Tools
Youth Participants	Pre-Post Survey Concept Mapping	• Collect data on participant diversity. • Examine trends in student growth regarding goals. • Get to know the participants before the program. • Gain feedback on successful programmatic components. • Get feedback on instructors.
Instructors	Post-Program Reflection (Program Snapshot and Program Goal Assessment) Post Season Recap	• Assess if programs are aligning with goals. • Keep record of basic program statistics and logistical information. • Generate ideas about instructional techniques and cultivating partnerships with other educators/scientists/cultural experts.
Chaperones (for DSSA only)	Post Survey Concept Mapping	• Get feedback on successful programmatic components. • Examine trends in perceived student growth. • Develop and strengthen partnerships. • Get feedback on instructors.
Management	Post Season Recap 5 Year Goal Review	• Refine goals and objectives. • Establish priorities for program development. • Edit evaluation tools.

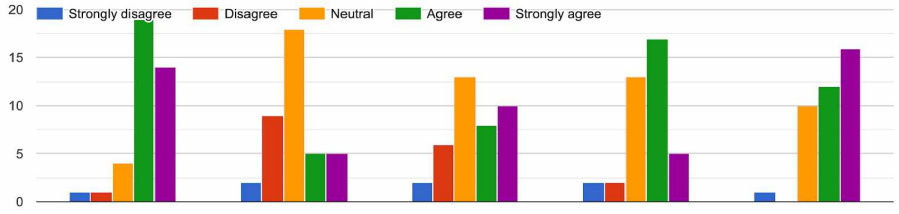
How to Use Evaluation Tools for Youth Participants

- To collect data on participant diversity:

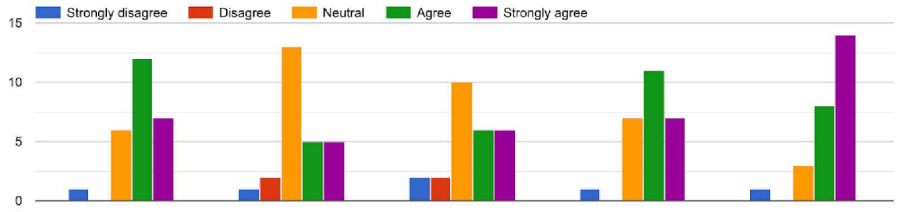
- Using the Pre-Survey, record percentages of students of different reported ethnicities. Either input all data on Google Forms or SurveyMonkey to calculate, or calculate by hand if paper forms are used. I would encourage recording these percentages every year to see variability in participant composition.
- From the Pre-Survey, compile percentages of how many students have never participated in the listed outdoor activities. Also, tabulate how many students have participated in these activities only a few times. While "a few times" isn't a precise number, consider these participants to be novices to these skills. Use this data to consider how many novices the programs are receiving. This will help address whether or not these programs serve to offer these specific outdoor experiences as first time experiences. Perhaps the listed activities do not fully address the most common new experiences participants find in these programs, so the list should be reconsidered ever 3-5 years.

- To examine trends in student growth regarding goals:
  - Compare student responses to the Likert scale series of statements before and after the program to see any shift from disagree to agree. Look at individual statements, as well as those collective statements connected to the goals of Personal Growth, Outdoor Skills, Knowledge of Denali, Knowledge of Public Lands, and Environment/Public Lands Attitudes and Behaviors to see if certain goals seem to be program strengths. Google Forms produces bar graphs to show scaled answers. Below is an example from past DSSA surveys showing students' ranking on conservation related statements. Notice how pre and post answers do not show significant shifts. Any of the small shifts could be do to a small sample size, or the fact that fewer students participated in the post than the pre.

Pre-Survey Conservation and Science



Post-Survey Conservation and Science



        - If Likert ratings continue not to show trends in growth, I would recommend rewriting statements that more accurately resemble specific skills participants practice during the program, rather than global statements (e.g., "I feel like I can lead my group on an off-trail hike" instead of "I feel like a leader."). If these questions are not being used by staff to evaluate change, more open response questions for each goal area could be added.
    - Open Response Questions on the Post-Survey: Open response questions should be read by instructors and managers to record trends in student growth and perceptions of programs. Each of the following questions targets a different programmatic goal.
        - *What is one new thing you learned from this trip that you think will stick with you?* (Record if what students report they learned matches with one of the defined cognitive goals or falls outside the domain of stated goals.)
        - *What is one outdoor skill you developed or worked on that you hope to use in the future?* (Keep note of specific outdoor skills students think are useful. Take note of whether or not responses indicate intent of future recreation.)
        - *Reflect on one way you feel like you grew, or challenged yourself during this trip?* (Observe if there are trends in answers about personal growth.)
        - *How would you like to use public lands in the future?* (Compare responses to find emerging themes about public land use.)
    - Concept Mapping: Look at the pre and post concept maps side by side. Have instructors take note of any trends they see from each group in terms of growth. Also, growth can be measured quantitatively by number of concepts from the pre to post map. Most importantly, have students use this tool for self-assessment and reflection. After students have completed their post-map, have a group discussion about significant changes they noticed. Have each person share how they feel their concept maps changed from beginning to end of the program. After sharing, have them write a short response about how their concepts changed through the program. Examine what students write and take note of any emerging themes about learning.
- To get to know the participants before the program:
    - The open response questions on the Pre-Survey are pulled from previous "Getting to Know You" questionnaires that have been given to participants on programs with Alaska Geographic. These questions are here as a means for youth participants to communicate with their instructors. They are not intended for comparison to post program responses.

- To gain feedback on successful programmatic components:
    - Instructors and managers can take note of which program components are mentioned in the following open response question from the Post-Survey: *What was your favorite part of the trip?* (Record general input on specific program components, and note if the favorite part of the trip aligns with any of the main goals, such as personal growth, outdoor skill development, or a cognitive component.)
- To get feedback on instructors:
    - Instructors and managers can look at open responses to the following question: *Who were your instructors? Do you have any feedback on your instructors?* (Since instructors were indicated as a key part of programs by several stakeholders, make sure instructors are meeting the needs of students and chaperones.)

How to Use Evaluation Tools for Instructors

- To assess if programs are aligning with goals:
    - From the Program Goal assessment part of the survey, at the end of every season, average together instructor scores for how each session met each program goal. Do one average for all responses, and then compare scores for DBE and DSSA independently to see if one program is more aligned with some of the goals than the other. Note which goals are being ranked as not met, primarily 1s and 2s, but consider 3s as well if there are no lower scores. Read all instructor feedback on low ranking goals. Use this information in two ways. 1) Consider if the goals ranking low simply are not well suited goal statements for the programs. 2) Consider program development in order to reach those goals. Conversely, if there are goals that are consistently ranked as being met, look at the feedback to find program strengths. Have instructors read these reports at the beginning of each new summer season to benefit from institutional knowledge and past experiences.
- To keep record of basic program statistics and logistical information:
    - Though program statistics are also recorded in part by students and instructor schedules, keep all of this information in one location using the Program Snapshot part of the Instructor Post-Program Reflection. Sometimes participants listed on participant lists drop out last minute, so numbers of students served by programs varies depending on what form you examine. By recording numbers in the Program Snapshot, more accurate numbers can be maintained for instructors and managers in regards to participants. Instructors have space to record thoughts on food, gear, and scheduling successes and failures to remind themselves, other instructors, and managers of areas for logistical improvement.

- To generate ideas about instructional techniques and cultivating partnerships with other educators/scientists/cultural experts:
    - Examine open responses to the following two questions from the Program Snapshot to record successes in instruction styles:
        - What instructional styles were implemented that you think helped student learning?
        - Please provide feedback on other adults who joined the group. Comment on content shared and instructional style. (Be positive, provisional, and specific. Think about information that would be useful for a future instructor working with these adults.)
    - Specific instructional techniques could become part of the program infrastructure if success is found with certain styles and recorded. Keeping track of what has worked for instructors can provide ideas for future instructors. Also, feedback on interactions with different adults might help identify future partnerships for the program. All this feedback should be read by future instructors and managers.

How to Use Evaluation Tools for Chaperones

- To gain feedback on successful programmatic components:
    - Look at responses to these questions on the Post-Survey and take note of program components that are highlighted to inform program development.
        - *What is your favorite part of the program?*
        - *Which components of the program do you think were most successful at sharing park science and information about public lands with your students?*
- To examine trends in perceived student growth:
    - Open response questions should be read by instructors and managers to record trends in student growth and perceptions of programs. Consider how responses discuss student growth and if any program components are aligned with these growth moments.
        - *Please share an example of student growth you observed.*
        - *What was something that you noticed was a challenge for your students?*
- To develop and strengthen partnerships:
    - Invite adult leaders from other organizations into program development by asking for new ideas. Instructors and managers can compile and implement doable suggestions. Follow up with chaperones for any ideas that warrant sharing resources or networks. Get this information from the following open response question from the chaperone Post-Survey: *Would you like to partner with us again to bring youth into Denali? If yes, are there any changes you would like for your*

group if you come again next year? Is there anything else you would like to share about the program?

- To get feedback on instructors:
    - Instructors and managers can look at open responses to the following question on the post-survey: *Who were your instructors? Do you have any feedback on your instructors?* (Since instructors were indicated as a key part of programs by several stakeholders, make sure instructors are meeting the needs of students from all different groups.)

How to Use Evaluation Tools for Management

- To establish priorities for program development:
    - Management can examine all evaluation tools to find emerging themes for targeting future program development in regards to content, logistical improvements, partnerships, and participant recruitment.
    - I recommended an end of season meeting with all instructors and managers where all parties first read all of the surveys. Questions discussed during end of season briefings could include:
        - What are favorite program components?
        - How are we meeting established goals?
        - Are there any goals we are not meeting?
        - Are there any new goals that should be added?
        - What could be changed about the program to better meet student needs?
        - Are there any logistical problems that need to be addressed?

        Data from evaluation tools and personal anecdote can be used to help answer these questions. Create a group list of priorities for program development for managers. The above questions and additional questions for the end of the season can be found on the Instructor/Manager Post-Season Recap Tool.
- To refine goals and objectives:
    - While concrete goals and objectives are not necessary for a successful program, they can assist instructors from different agencies, as well as from different seasons, to communicate about the program and to plan instructional content and style. A list of goals and objectives can serve for internal communication among staff as well as to focus instruction for the purpose of student outcomes.
    - Every five years, consider repeating a process of interviewing a multitude of stakeholders involved in the program. See if the program aligns with similar goals or has shifted in purpose.
- To edit Evaluation Tools:

- Consider removing, changing, or adding open response questions to the student, chaperone, and instructor surveys to align with current thoughts on program goals, or the need to collect specific information on logisticial changes (such as a change in menu).
- Consider switching to SurveyMonkey or another software to assist in a more fluid comparison of pre and post answers to Likert scale questions.

Appendix G: Interview Questions by Stakeholder

	Instructors	Direct Managers	General Managers	Chaperones
Program Components Feedback	What is your favorite part of the program?			Do you have any favorite elements of the program you hope will remain for future DSSA/DBE students to experience?
Student Impact (Desired broad impact from participation)	What do you think is the main benefit of this program for students?	What do you think is the main benefit of this program for students?	What do you hope students participating in high school youth programs are taking away from their time in Denali?	What do you hope students take away from the program?
Program Outcomes (Perceived outcomes)	What have you seen students take away from the program?	What have you seen students take away from the program?	What are some long and short term outcomes you desire out of youth programming?	Have you noticed any long term impacts/influence of the program on your students? *For example, have they talked about the trip weeks to months after it ended? Have they explored other courses or careers and referenced this experience as a motivation?*
Articulate Program Objective	How would you define the main objectives or goals of this program?	How would you define the main objectives or goals of this program?		
Change	Are there any aspects of the program you would like to see	How do you envision this program evolving?	How do you envision youth programs evolving?	Are there any types of experiences you would like to see added in for students

	changed? If yes, which aspects and why? Are there any elements of the program that you think aren't working for students?			to experience or participate in? *For example, more hiking, different kinds of research projects, cultural experiences, camping skills, types of people they could interact with, etc.?*
Organizational Goals		How do you see these programs fitting into organization missions?	How do you see youth programs fitting into organization missions?	Does this program tie into (your organization's) goals? If so, how? How does DSSA tie into the goals/mission of Chugach Schools or some of the specific programs at Chugach Schools that students are a part of?